THE NATURAL HISTORY OF THE HUMAN TEETH.

PART II.

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NOTICE

A

PRACTICAL TREATISE

ON THE

DISEASES

OF THE

TEETH;

INTENDED AS A

SUPPLEMENT

TO THE

NATURAL HISTORY OF THOSE PARTS.

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THE

CONTENTS.

CHAP. I. OF the Diſeaſes of the Teeth, and the Conſequences of them.

Sect. I. The Decay of the Teeth, ariſing from Rottenneſs page 1

Symptoms of Inflammation 10

Stopping of the Teeth 20

Sect. II. The Decay of the Teeth, by Denudation 24

Sect. III. Swelling of the Fang 27

Sect. IV. Gum Boils 29

Sect. V. Excreſſences from the Gum 39

Sect. VI. Deeply-ſeated Abceſſes in the Jaws 41

Sect. VII. Abceſs of the *Antrum Maxillare* 44

CHAP. II. Of the Diſeaſes of the Alveolar Proceſſes, and the Conſequences of them 47

CHAP. III. Of the Diſeaſes of the Gums, and the Conſequences of them 55

Sect. I. The Scurvy in the Gums, vulgarly ſo called

Sect. II. Callous Thickenings of the Gums 59

CHAP. IV. Of Nervous Pains in the Jaws 61

CHAP. V. Of the Extraneous Matter upon the Teeth 64

CHAP.

The CONTENTS.

CHAP. VI. Of the Irregularity of the Teeth 72

CHAP. VII. Of Irregularities between the Teeth and Jaw 82

Of Supernumerary Teeth 83

CHAP. VIII. Of the Under Jaw 84

CHAP. IX. Of Drawing the Teeth 87

Tranſplanting Teeth 94

Of the State of the Gums and Sockets 95

Of the Age of the Perſon who is to have the Scion Tooth 98

Of the Scion Tooth 99

Of replacing a Sound Tooth when drawn by Miſtake 103

Of Tranſplanting a Dead Tooth 105

Of the immediate Faſtening of a Tranſplanted Tooth 106

CHAP. X. Of Dentition 113

Of the Cure 120

Of cutting the Gums 121

Caſes 125

INTRODUCTION.

THE importance of the Teeth is ſuch, that they deſerve our utmoſt attention, as well with reſpect to the preſervation of them, when in an healthy ſtate, as to the methods of curing them, when diſeaſed. They require this attention, not only for the preſervation of themſelves, as inſtruments uſeful to the body, but alſo on account of other parts with which they are connected; for diſeaſes in the Teeth are apt to produce diſeaſes in the neighbouring parts, frequently of very ſerious conſequences; as will evidently appear in the following Treatiſe.

One might at firſt imagine, that the diſeaſes of the Teeth muſt be very ſimple, and like thoſe which

take place every where elſe in the bony parts of our body; but experience ſhews the contrary. The Teeth being ſingular in their ſtructure, and ſome other circumſtances, have diſeaſes peculiar to themſelves. Theſe diſeaſes, conſidered abſtractedly, are indeed very ſimple; but by the relations which the Teeth bear to the body in general, and to the parts with which they are immediately connected, they become extremely complicated. The diſeaſes which may ariſe in conſequence of thoſe of the Teeth, are various; ſuch as Abceſſes, Carious Bones, &c.; many of which, although proceeding originally from the Teeth, are more the object of the Surgeon than of the Dentiſt, who will find himſelf as much at a loſs in ſuch caſes, as if the Abceſs or Carious Bone were in the leg, or any other diſtant part. All the diſeaſes of the Teeth, which are common to them with the other parts of the body, ſhould be put under the management of the Phyſician or Surgeon; but thoſe which are peculiar to the Teeth, and their connections, belong properly to the Dentiſt.

It is not my preſent purpoſe to enumerate every diſeaſe capable of producing ſuch ſymptoms as may lead

us

us to ſuſpect the Teeth; for the Jaws may be affected by almoſt every kind of diſorder. I ſhall therefore confine myſelf to the diſeaſes of the Teeth, Gums, and Alveolar Proceſſes; which parts having a peculiar connection, their diſeaſes fall properly within the province of the Dentiſt. I ſhall alſo purpoſely avoid entering into common Surgery; not to lead the Dentiſt beyond his depth, and to matters of which it is to be ſuppoſed he has not acquired a competent knowledge.

In order that the reader may perfectly underſtand what follows, it will be neceſſary for him previouſly to conſider and comprehend the anatomy and uſes of every part of a Tooth, as explained in my *Natural Hiſtory of the Human Teeth*, to which I ſhall be obliged frequently to refer. Without ſuch previous ſtudy, the Dentiſt will often be at a loſs to account for many of the diſeaſes and ſymptoms mentioned here, and will retain many vulgar errors imbibed by converſing with ignorant people, or by reading books in which the anatomy and phyſiology of the Teeth are treated without a ſufficient knowledge of the ſubject.

Whichever of the connected parts be originally diſeaſed, the Teeth are commonly the greateſt ſufferers. None of thoſe parts can be diſtempered, without communicating to the Teeth ſuch morbid effects, as tend to the deſtruction of them.

CHAP.

CHAP. I.

OF THE

DISEASES of the TEETH,

AND THE

CONSEQUENCES OF THEM.

SECT. I.

The Decay of the Teeth, arising from Rottenness.

THE most common disease to which the Teeth are exposed, is such a decay as would appear to deserve the name of mortification. But there is something more; for the simple death of the part would produce but little effect, as we find that Teeth are not subject to putrefaction after death; and therefore I am apt to suspect, that, during life, there is some operation going on,

on, which produces a change in the diſeaſed part. It almoſt always begins externally in a ſmall part of the body of the Tooth, and commonly appears at firſt as an opaque white ſpot. This is owing to the enamel's loſing its regular and cryſtalized texture, and being reduced to a ſtate of powder, from the attraction of coheſion being deſtroyed; which produces ſimilar effects to thoſe of powdered cryſtal. When this has crumbled away, the bony part of the Tooth is expoſed; and when the diſeaſe has attacked this part, it generally appears like a dark brown ſpeck. Sometimes however, there is no change of colour, and therefore the diſeaſe is not obſervable, till it has made a conſiderable hole in the Tooth. The dead part is generally at firſt round, but not always; its particular figure depending more on the place where it begins, than on any other circumſtance. It is often obſerved on the hollow parts of the grinding ſurface of the *Molares*, and there looks like a crack filled with a very black ſubſtance. In the inciſors, the diſeaſe uſually begins pretty near the neck of the Tooth; and the ſcooping proceſs goes on enlarging the cavity, commonly acroſs the ſame part of the Tooth, which almoſt divides it into two. When ſuch a

diſeaſed

diſeaſed Tooth gives way, the miſchief is occaſioned by its body breaking off.

When it attacks the bony part, it appears firſt to deſtroy the earth, for the bone becomes ſofter and ſofter, and is at laſt ſo ſoft on the exterior expoſed ſurface, that it can be picked away with a pin, and when allowed to dry, it cracks like dried clay.

It begins ſometimes in the inſide of the Tooth, although but rarely. In this caſe the Tooth becomes of a ſhining black, from the dark colour being ſeen through the remaining ſhell of the Tooth, and no hole is found leading into the cavity.

This blackneſs is ſeldom more than a portion of the bony part decayed or mortified. However, it often happens, that the remaining part of the Tooth becomes ſimply dead; in which ſtate it is capable of taking on a dye. As it is generally on the external ſurface, one might expect no great miſchief would enſue; but the tendency to mortification goes deeper and deeper, till at laſt it arrives at the cavity of the Tooth, and the mortification follows. Mortification is common

common to every part of the body: but in moſt other parts, this tendency is owing in a great meaſure to the conſtitution, which being corrected, that diſpoſition ceaſes; but here it is local, and as ſuch it would appear that we have no power of reſiſting it. When gone thus far, the decay makes a quicker progreſs, ſimilar to thoſe caſes where the decay begins in the cavity; for then this diſpoſition is given to the whole cavity of the Tooth, which being a much larger ſurface than what the diſeaſe had before to act upon, the increaſe of the decay ſeems to be in the ſame proportion: at laſt it ſcoops out its inner ſubſtance, till almoſt nothing is left but a thin ſhell, which, generally, being broken by maſtication, a ſmaller or larger opening is made, and the whole cavity becomes at length expoſed.

The canal in the Fang of the Tooth is more ſlowly affected: the ſcooping proceſs appears to ſtop there, for we ſeldom know a Fang become very hollow to its point, when in the form of a ſtump; and it ſometimes appears ſound, even when the body of the Tooth is almoſt deſtroyed: hence I conclude, that the Fang of the Tooth has greater living powers than the Body, by which the proceſs of the diſeaſe is retarded, and this

part

part appears at laſt only to loſe its living principle, and not to take on the mortifying proceſs above deſcribed; for which reaſon it remains ſimply a dead Fang; however it does not remain perfectly at reſt.

This is the ſtage in which it is called a Stump. It begins now to loſe its ſenſibility, and is ſeldom afterwards the cauſe of pain.

Thus in appearance, it will remain ſometimes for many years, but there will be more or leſs of a change going on; Nature will be attempting to make up the deficiency, by endeavouring to increaſe the Stump; for in many caſes we find the Stumps thickened and lengthened at their terminations, or ſmall ends; but it is a proceſs ſhe is not equal to, therefore no advantages accrue from it. When ſhe either fails in this proceſs, or is in ſuch a ſtate as not to attempt it, then by this condition of the Tooth a ſtimulus is given to the alveolar proceſſes, which produces a filling up of the ſocket from the bottom, whereby the Stumps are gradually protruded. But although they are puſhed out at the bottom, they ſeldom or never project farther beyond the gum than at firſt; and that part of the

Tooth which projects, ſeems to decay in proportion to its projection. Beſides this decay at the external end of the Stump, there is an abſorption of the Fang at the bottom, which is known by the following obſervation: the end of the Stump, which was in the gum or jaw, becomes irregularly blunted, and often rough, and has not the appearance of the end of the Fang of a ſound Tooth.

Such Stumps are in general eaſily extracted, being attached often to little more than the gum, and that ſometimes looſely.

Although the diſeaſe appears to be chiefly in the Tooth itſelf, and but little to depend on external cauſes, yet in many caſes the part which is already rotten, ſeems to have ſome influence upon that which remains; for if the rotten part be perfectly removed before it has arrived at the canal of the Tooth, a ſtop is ſometimes put to the farther progreſs of the decay, at leaſt for a time.

However this is not conſtantly ſo; it is oftener the contrary; but it is expedient in moſt caſes to make this trial, as it is always right to keep a Tooth clean, and free from ſpecks.

This

This decay of the Teeth does not ſeem to be ſo entirely the effect of accident as might be imagined; for it ſometimes takes place in them by pairs, in which caſe we may ſuppoſe it owing to an original cauſe coming into action at its ſtated time; the correſponding Teeth being in pairs, with reſpect to the diſeaſe, as well as to ſituation, ſhape, &c.

This opinion is ſomewhat ſtrengthened by the fore Teeth in the lower Jaw not being ſo ſubject to decay as thoſe in the upper, although equally liable to all accidents ariſing from external influence, which could produce the diſeaſe in general.

The fore Teeth in the lower Jaw appear to be leſs ſubject to this diſeaſe than any of the others; the fore Teeth in the upper Jaw, and the grinders in both, are of courſe more frequently affected.

This diſeaſe and its conſequences ſeem to be peculiar to youth and middle age; the ſhedding Teeth are as ſubject to it, if not more ſo, than thoſe intended to laſt through life; and we ſeldom or ever ſee any per-

ſon, whoſe Teeth begin to rot after the age of fifty years.

This might be ſuppoſed to ariſe from the diſproportion that the number of Teeth after fifty bear to them before it; but the number of diſeaſed Teeth after fifty do not bear the ſame proportion.

This diſeaſe has not hitherto been accounted for; if it had been always on the inſide of the cavity, it might have been ſuppoſed to be owing to a deficiency of nouriſhment from ſome fault in the vaſcular ſyſtem; but as it begins moſt commonly externally, in a part where the Teeth in their moſt ſound ſtate receive little or no nouriſhment, we cannot refer it to that cauſe.

It does not ariſe from any external injury, or from menſtrua, which have a power of diſſolving part of a tooth; for any thing of that kind could not act ſo partially: and we can obſerve in thoſe Teeth where the diſeaſe has not gone deep, that from the black ſpeck externally there is a gradual decay or alteration leading to the cavity, and becoming fainter and fainter. We may therefore

therefore reaſonably ſuppoſe, that it is a diſeaſe ariſing originally in the Tooth itſelf; becauſe when once the ſhell of the Tooth has given way to the cavity, the cavity itſelf ſoon becomes diſeaſed in the ſame way. That the diſeaſe ſpreads thus rapidly over the cavity, as ſoon as the Tooth has given way, does not depend ſimply on the expoſure; for if a ſound Tooth be broken by accident, ſo as to expoſe the cavity, no ſuch quick decay enſues: however, ſometimes we find in thoſe caſes, that expoſure of the cavity will produce a decay, and even pain, ſimilar to an original diſeaſe; and in the diſeaſed Tooth we find that the expoſure has a conſiderable effect in haſtening the progreſs of the diſeaſe; for if the Tooth be ſtopped ſo as to prevent its expoſure to external injury, its cavity will not nearly ſo ſoon become diſeaſed. Expoſure therefore ſeems at leaſt to aſſiſt the decay.

How far a rotten Tooth has the power of contaminating thoſe next to it, I believe, is not yet completely aſcertained; ſome caſes ſeem to favour this idea, and many to contradict it. We frequently ſee two Teeth rotten in places exactly oppoſite to each other, and as one of them began firſt to decay, it gives a ſuſpicion

that

that the laſt diſeaſed was infected by that which received the firſt morbid impreſſion.

On the contrary, we often ſee one diſeaſed, whilſt another Tooth, in contact with the decayed part, remains perfectly ſound.

SYMPTOMS of INFLAMMATION.

FEW or no ſymptoms are produced by this diſeaſe, beſides the above appearances, till the cavity of the Tooth is expoſed; however, it often happens, that a tenderneſs, or a ſoreneſs upon touch, or other external influences, takes place long before; but when the cavity is expoſed, then pain and other ſymptoms often begin, which are generally very conſiderable: however, the expoſure of the cavity of a Tooth, does not in all caſes give pain. Some Teeth ſhall moulder wholly away, without ever having any ſenſation.

In many caſes, there will be very acute pain upon the cavity being expoſed, which will ſubſide, and recur again,

again, without producing any other effect; but it more frequently happens, that this pain is the firſt ſymptom of inflammation, and is in moſt caſes very conſiderable; more ſo than that ariſing from ſuch an inflammation in other places. The ſurrounding parts ſympathize commonly to a conſiderable extent, viz. the Gums, Jawbones, and integuments covering them; they inflame and ſwell ſo much as to affect the whole of that ſide of the face, where the affected Tooth is ſituated. The mouth can hardly be opened; the glands of that ſide of the neck often ſwell; there is an increaſe of the ſaliva, and the eye is almoſt cloſed; the Tooth not giving way to the ſwelling of the ſoft parts within it: and for this reaſon the local effects of the Inflammation cannot be ſo viſible as in the ſoft parts.

This inflammation of the Tooth often laſts a conſiderable time, and then gradually ſubſides. We may ſuppoſe, according to the general law of inflammation, that it is at firſt of the adheſive kind, and accordingly we ſometimes find the Teeth ſwelled at their ends, which is a character of the adheſive ſtage of inflammation; and ſometimes two fangs are grown together. That we ſeldom find adheſions between the Teeth and

ſur-

ſurrounding parts may be reaſonably imputed to their leſs aptitude for ſuch connections. The ſuppurative inflammation ſucceeds; but as a Tooth has not that power of ſuppuration which leads to granulations, ſo as to be buried, covered up, and made part of ourſelves, as happens to other bones, (which would deſtroy any uſe of a Tooth) the inflammation wears out, or rather the parts not being ſuſceptible of this irritation, beyond a certain time, the inflammation gradually goes off, and leaves the Tooth in its original diſeaſed ſtate. No permanent cure therefore can poſſibly be effected by ſuch inflammations, but the parts being left in the ſame ſtate as before, they are ſtill ſubject to repetitions of inflammation, till ſome change takes place, preventing future attacks, which I believe is generally, if not always, effected by the deſtruction of thoſe parts which are the ſeat of it, *viz.* the ſoft parts within the Tooth.

Nature ſeems, in ſome meaſure, to have conſidered the Teeth as aliens, only giving them nouriſhment while ſound and fit for ſervice, but not allowing them when diſeaſed the common benefits of that ſociety in which they are placed. They cannot exfoliate, as no operations go on in them except growth; therefore, if any part

part is dead, the living has not the power of throwing it off, and forming an external ſurface capable of ſupporting itſelf, like the other parts of the body: indeed, if they had ſuch a power, no good purpoſe could be anſwered by it; for a piece of Tooth, ſimply dead, is almoſt as uſeful as if the whole was living: which may be obſerved every day.

The pain, however, appears to take its riſe from the Tooth as a centre. That it ſhould be more ſevere than what is generally produced by ſimilar inflammations in other parts of the body, may, perhaps, be accounted for, when we conſider, that theſe parts do not readily yield; as is likewiſe the caſe in whitloes.

It ſometimes happens, that the mind is not directed to the real ſeat of the diſeaſe, the ſenſation of pain not ſeeming to be in the diſeaſed Tooth, but in ſome neighbouring Tooth which is perfectly ſound. This has often miſled operators, and the ſympathiſing Tooth has fallen a ſacrifice to their ignorance.

In all caſes of diſeaſed Teeth, the pain is brought on by circumſtances unconnected with the diſeaſe; as

for inſtance Cold, wherefore they are more troubleſome commonly in winter than in ſummer. Extraneous matter entering the cavity, and touching the nerve and veſſels, will alſo bring on the pain.

This pain is frequently obſerved to be periodical; ſometimes there being a perfect intermiſſion, ſometimes only an abatement of it. The paroxyſm comes on once in twenty four hours; and, for the moſt part, towards the evening. The bark has therefore been tried; but that failing, the diſorder has been ſuſpected to be of the rheumatic kind, and treated accordingly with no better ſucceſs. At length, after a more particular examination of the Teeth, one of them has been ſuſpected to be unſound; and, being extracted, has put an end to the diſorder. This ſhews how injudicious it is to give medicines in ſuch caſes, while the true ſtate of the Tooth is unknown.

This diſeaſe is often the cauſe of bad breath, more ſo than any other diſeaſe of thoſe parts; eſpecially when it has expoſed the cavity of the Tooth. This moſt probably ariſes from the rotten part of the Tooth,

and

and the juices of the mouth, and food, all ſtagnating in this hollow part, which is warm, and haſtens putrefaction in them.

I come now to the prevention and cure of this diſeaſe.

The firſt thing to be conſidered, is, the cure of the decaying ſtate of the Tooth, or rather the means of preventing the farther progreſs of the decay; and more eſpecially before it hath reached the cavity, whereby the Tooth may be in ſome degree preſerved; the conſequent pain and inflammations, commonly called Tooth-ach, avoided, and often the conſequent abſceſſes called Gum Boils. I believe, however, that no ſuch means of abſolute prevention are as yet known. The progreſs of the diſeaſe, in ſome caſes, appears to have been retarded, by removing that part which is already decayed; but experience ſhews, that there is but little dependence upon this practice. I have known caſes, where the black ſpot having been filed off, and ſcooped entirely out, the decay has ſtopped for

many years. This practice is ſuppoſed to prevent at leaſt any effect, that the part already rotten may have upon the ſounder parts; however, if this is all the good that ariſes from this practice, I believe, in moſt caſes, it might be as well omitted. Even if it were an effectual practice, it could not be an univerſal one; for it is not always in the power of the operator to remove this decayed part, either on account of its ſituation, or on account of its having made too great a progreſs, before it is diſcovered. When it is on the baſis of a grinder, or on the poſterior ſide of its neck, it can ſcarcely be reached. It becomes alſo impracticable, when the diſeaſe is ſtill allowed to go on, and the cavity becomes expoſed, ſo that the patient is now liable to all the conſequences already deſcribed, and the Tooth is making haſte towards a total decay; in ſuch a caſe, if the decay be not too far advanced; that is, if it be not rendered uſeleſs ſimply as a Tooth, I would adviſe that it be extracted; then immediately boiled, with a view to make it perfectly clean, and alſo deſtroy any life there may be in the Tooth; and then that it be reſtored to the ſocket: this will prevent any farther decay of the Tooth, as it is now dead, and not to be

acted

acted upon by any diſeaſe, but can only ſuffer chymically or mechanically.

This practice, however, I would only recommend in grinders, where we have no other reſource on account of the number of fangs, as will be more fully explained hereafter. This practice has ſometimes been followed with ſucceſs; and when it does ſucceed, it anſwers the ſame end as the burning the nerve, but with much greater certainty.

If the patient will not ſubmit to have the Tooth drawn, the nerve may be burned: that this may have the deſired effect, it muſt be done to the very point of the fang, which is not always poſſible. Either of the concentrated acids, ſuch as thoſe of vitriol, nitre, or ſea ſalt, introduced as far into the fang of the Tooth as poſſible, is capable of deſtroying its ſoft parts, which moſt probably are the ſeat of pain: a little cauſtic alkali will produce the ſame effect. But it is a difficult operation to introduce any of theſe ſubſtances into the root of the fang, till the decay has gone a conſiderable length, eſpecially, if it be a Tooth of the upper jaw; for it is hardly poſſible to make fluids paſs againſt their own gravity;

gravity; in theſe caſes, the common cauſtic is the beſt application, as it is a ſolid. The cauſtic ſhould be introduced with a ſmall doſſil of lint, but even this will ſcarcely convey it far enough. If it be the lower jaw, the cauſtic need only be introduced into the hollow of the Tooth, for by its becoming fluid, by the moiſture of the part, it will then deſcend down the cavity of the fang, as will alſo any of the acids; but patients will often not ſuffer this to be done, till they have endured much pain, and ſeveral inflammations.

When there is no other ſymptom except pain in the Tooth, we have many modes of treatment recommended, which can only be temporary in their effects. Theſe act by derivation, or ſtimulus applied to ſome other part of the body. Thus to burn the ear by hot irons, has ſometimes been a ſucceſsful practice, and has relieved the Tooth-ach.

Some ſtimulating medicine, as ſpirit of lavender, ſnuffed up into the noſe, will often carry off the pain.

When an inflammation takes place in the ſurrounding parts, it often is aſſiſted by an additional cauſe, as cold,

cold, or fever: when the inflammation hath taken place in a great degree, then it becomes more the object of another conſideration; for it may be leſſened like any other inflammation ariſing from ſimilar cauſes, the preſſure of an extraneous body, or expoſure of an internal cavity.

If the inflammation be very great, it will be proper to take away ſome blood. The patient may likewiſe properly be adviſed to hold ſome ſtrong vinous ſpirit for a conſiderable time, in his mouth. Diluted acids, as vinegar, &c. may likewiſe be of uſe, applied in the ſame manner. Likewiſe, preparations of lead would be adviſeable; but theſe might prove dangerous, if they ſhould be accidentally ſwallowed.

If the ſkin is affected, poultices, containing ſome of the above-mentioned ſubſtances, produce relief. The pain, in many caſes, being often more than the patient can well bear, warm applications to the part have been recommended, ſuch as hot brandy, to divert the mind; alſo ſpices, eſſential oils, &c. which laſt are, perhaps, the beſt. A little lint or cotton ſoaked in laudanum, is often applied with ſucceſs; and laudanum ought

ought likewiſe to be taken internally, to procure an interval of ſome eaſe. Bliſters are of ſervice in moſt inflammations of theſe parts, whether they ariſe from a diſeaſed Tooth, or not. They cannot be applied to the part, but they divert the pain, and draw this ſtimulus to another part: they may be conveniently placed either behind the ear, or in the nape of the neck. Theſe laſt-mentioned methods can only be conſidered as temporary means of relief, and ſuch as only affect the inflammation. Therefore the Tooth is ſtill expoſed to future attacks of the ſame diſeaſe.

STOPPING of the TEETH.

IF the deſtruction of the life of the Tooth, either by drawing and reſtoring it again, or by the actual or potential cauteries, has not been effected, and only the cure of the inflammation has been attempted, another method of preventing inflammation is to be followed, which is to allow as little ſtimulus to take place as poſſible. The cavity of the Tooth not being capable of taking the alarm like moſt other cavities in the

the body, and of courſe not ſuppurating, as has been already obſerved, often no more is neceſſary, either to prevent the inflammation from taking place altogether, or extending farther, than to exclude all extraneous irritating matter; therefore, the ſtopping up the cavity becomes, in many caſes, the means of preventing future attacks of the inflammation, and often retards even the progreſs of the diſeaſe, that is, the farther decay of the Tooth, ſo that many people go on for years thus aſſiſted: but it is a method which muſt be put in practice early, otherwiſe it cannot be continued long; for, if the diſeaſe has done conſiderable damage to the inſide of the Tooth, ſo as to have weakened it much, the whole body of the Tooth, moſt probably, will ſoon give way in maſtication: therefore, under ſuch circumſtances, the patient muſt be cautioned, not to make too free with the Tooth in eating.

Gold and lead are the metals generally made uſe of for ſtopping Teeth. Gold being leſs pliable, muſt be uſed in the leaf; lead is ſo ſoft in any form, as to take on any ſhape by a very ſmall force.

Stuffing the hollow Tooth with wax, galbanum, &c. can be but of very little ſervice, as it is in moſt caſes impoſſible to confine theſe ſubſtances, or preſerve them from being ſoon worn away; however, they have their uſes, as it is a practice which the patients themſelves can eaſily put in execution.

It often happens from neglect, and much oftener in ſpite of all the means that can be uſed, that the Tooth becomes ſo hollow, as to give way, whereby the paſſage becomes too large to keep in any of the above-mentioned ſubſtances; however, in this caſe, it ſometimes happens, that a conſiderable part of the body of the Tooth will ſtill ſtand, and then a ſmall hole may be drilled through this part, and after the cavity hath been well ſtopped, a ſmall peg may be put into the hole, ſo as to keep in the lead, gold, &c. But when this cannot be done, we may conſider the broken Tooth as entirely uſeleſs, or at leaſt it will ſoon be ſo; and it is now open to attacks of inflammation, which the patient muſt either bear, or ſubmit to have the Tooth pulled out. If the firſt be choſen, and the repeated inflammations ſubmitted to, a cure will be performed in time, by the

ſtump

ſtump becoming totally dead; but it is better to have it pulled out, and ſuffer once for all.

Upon pulling out theſe Teeth, we may in general obſerve a pulpy ſubſtance at the root of the fang, ſo firmly adhering to the fang, as to be pulled out with it. This is in ſome pretty large, ſo as to have made a conſiderable cavity at the bottom of the ſocket. This ſubſtance is the firſt beginning of the formation of a Gum Boil, as it at times inflames and ſuppurates.

SECT. II.

The Decay of the Teeth, by Denudation.

THERE is another decay of the Teeth much leſs common than that already deſcribed, which has a very ſingular appearance. It is a waſting of the ſubſtance of the Tooth very different from the former. In all the inſtances I have ſeen, it has begun on the exterior ſurface of the Tooth, pretty cloſe to the arch of the gum. The firſt appearance is a want of enamel, whereby the bony part is left expoſed, but neither the enamel, nor the bony part alter in conſiſtence as in the above deſcribed decay. As this decay ſpreads, more and more of the bone becomes expoſed, in which reſpect alſo it differs from the former decay; and hence it may be called a denuding proceſs. The bony ſubſtance of the Teeth alſo gives way, and the whole waſted ſurface has exactly the appearance, as if the Tooth had been filed with a rounded file, and afterwards

wards had been finely poliſhed. At theſe places the bony parts, being expoſed, become brown.

I have ſeen inſtances, where it appeared as if the outer ſurface of the bony part, which is in contact with the inner ſurface of the enamel, had firſt been loſt, ſo that the attraction of coheſion between the two had been deſtroyed; and as if the enamel had been ſeparated for want of ſupport, for it terminated all at once.

In one caſe, the two firſt inciſors had loſt the whole of the enamel; on their anterior ſurfaces, they were hollowed from ſide to ſide, as if a round file had been applied to them longitudinally, and had the fineſt poliſh imaginable. The three grinders on each ſide appeared as if a round file had been uſed on them, in a contrary direction to that on the inciſors, *viz.* acroſs their bodies cloſe to the gum, ſo that there was a groove running acroſs their bodies, which was ſmooth in the higheſt degree. Some of the other Teeth in the ſame jaw had begun to decay in a ſimilar manner; alſo the Teeth in the lower jaw were become diſeaſed.

I ſaw

I ſaw a caſe very lately, where the four inciſors of the upper jaw had loſt their enamel entirely on their anterior ſurfaces, and there was ſcarcely a Tooth in the mouth, which had not the appearance of having had a file applied acroſs it cloſe to the gum.

Thoſe whom I have known, have not been able to attribute this diſeaſe to any cauſe; none of them had ever done any thing particular to the Teeth, nor was there in appearance any thing particular in the conſtitution, which could give riſe to ſuch a diſeaſe. In the firſt of theſe caſes, the perſon was about forty; in the laſt, about twenty years of age.

From its attacking certain Teeth rather than others, in the ſame head, and a particular part of the Tooth, I ſuſpect it to be an original diſeaſe of the Tooth itſelf; and not to depend on accident, way of life, conſtitution, or any particular management of the Teeth.

SECT.

SECT. III.

Swelling of the Fang;

ANOTHER diſeaſe of the Teeth is a ſwelling of the Fang, which moſt probably ariſes from inflammation, while the body continues ſound, and is of that kind which in any other bone would be called a Spina Ventoſa*. It gives conſiderable pain, and nothing can be ſeen externally.

The pain may either be in the Tooth itſelf, or the alveolar proceſs, as it is obliged to give way to the increaſe of the Fang.

As a ſwelling of this kind does not tend to the ſuppurative inflammation, and as I have not been able to diſtinguiſh its ſymptoms from thoſe of the nervous Tooth-ach, it becomes a matter of ſome difficulty to the operator; for the only cure yet known is the ex-

* Vide Natural Hiſtory of the Teeth, page 37.

traction

traction of the Tooth; which has been often neglected on a ſuppoſition that the pain has been nervous.

Theſe diſeaſes of the Teeth, ariſing from inflammation, become often the cauſe of diſeaſes in the alveolar proceſſes, and gums; which I ſhall proceed to deſcribe.

SECT.

SECT. IV.

Gum Boils.

ALTHOUGH ſuppuration cannot eaſily take place within the cavity of a Tooth, yet it often happens, that the inflammation, which is extended beyond it, is ſo great, as to produce ſuppuration in the jaw at the bottom of the ſocket, where the diſeaſed Tooth is, forming there a ſmall abceſs, commonly called a Gum Boil.

This inflammation is often very conſiderable, eſpecially when the firſt ſuppuration takes place. It is often more diffuſed than inflammations in other parts, and affects the whole face, &c.

The matter, as in all other abceſſes, makes its own way outwards, and as it cannot be evacuated through the Tooth, it deſtroys the alveolar proceſſes, and tumifies the gum, generally on the fore part, either pointing

directly at the root of the Tooth, or ſeparating the gum from it; and is evacuated in one or other of theſe two ways, ſeldom on the inſide of the gum: however, this ſometimes happens.

Gum boils ſeldom ariſe from other cauſes; however, it ſometimes happens that they originate from a diſeaſe in the ſocket or jaw, having no connection with the Tooth, and only affecting it ſecondarily. Upon drawing ſuch Teeth, they are generally found diſeaſed at or near the point, being there very rough and irregular, ſimilar to ulcerating bones. There is no diſeaſe to appearance in the body of the Tooth. Theſe laſt deſcribed Gum Boils may ariſe wholly from ſuch a cauſe, the appearance on the fang of the Tooth being only an effect.

Theſe abceſſes, whether ariſing from the Teeth or the ſockets, always deſtroy the alveolar proceſſes on that ſide where they open; as is very evident in the jaw-bones of many ſculls; on which account the Tooth becomes more or leſs looſe. It may be perceived in the living body; for when the alveolar proceſs is intirely deſtroyed on the outſide of the Tooth, if

that

that Tooth be moved, the motion will be obſerved under the gum, along the whole length of the fang.

So far the Teeth, alveolar proceſſes, and gums, become diſeaſed by conſent.

It is common for theſe abceſſes to ſkin over, and, in all appearance, heal. This is peculiar to thoſe which open through the Gums, but thoſe which diſcharge themſelves between the Gums and Teeth, can never heal up, becauſe the Gum cannot unite with the Tooth; however, the diſcharge in them becomes leſs at times, from a ſubſiding of the ſuppuration; which indeed is what allows the other to ſkin over. But either expoſure to cold, or ſome other accidental cauſe, occaſioning a freſh inflammation, produces an increaſed ſuppuration, which either opens the old orifice in the Gum, or augments the diſcharge by the ſide of the Tooth; however, I believe, the inflammation in this laſt caſe is not ſo violent as in the other, where a freſh ulceration is neceſſary for the paſſage of the matter.

Thus a Gum Boil goes on for years, healing and opening alternately; the effect of which is, that the alveolar proceſſes are at length abſorbed, and the Tooth gets looſer and looſer, till it either drops out, or is extracted.

Moſt probably in all ſuch caſes, the communication between the cavity of the Tooth, and the Jaw, is cut off; yet it keeps in part its lateral attachments, eſpecially when the gum graſps the Tooth; but in thoſe caſes, where the matter paſſes between the Gum and the Tooth, theſe attachments are leſs; but ſome of them are ſtill retained, particularly on the ſide oppoſite to the paſſage for the matter.

Gum Boils are eaſily known. Thoſe which open through the Gum may be diſtinguiſhed by a ſmall riſing between the arch of the Gum, and the attachment of the lip; upon preſſing the Gum at the ſide of this point, ſome matter will commonly be obſerved, oozing out at the eminence. This eminence ſeldom ſubſides entirely; for even when there is no diſcharge, and the opening is healed over, a ſmall riſing may ſtill

ſtill be perceived, which ſhews that the Gum Boil has been there.

Thoſe Gum Boils which diſcharge themſelves between the Gum and the Tooth, are always diſcovered by preſſing the Gum, whereby the matter is preſſed out, and is ſeen lying in the angle between the Gum and Tooth.

Theſe abceſſes happen much more frequently in the upper jaw, than in the lower, and alſo more frequently to the *cuſpidati*, *inciſores*, and *bicuſpides* in that jaw, than to the *molares*; ſeldom to the fore Teeth in the lower jaw.

As Gum Boils are in general the conſequence of rotten Teeth, we find them in young and middle aged people more frequently than in old; but they appear to be moſt common to the ſhedding Teeth. This will ariſe from thoſe Teeth being more liable to become rotten; and perhaps there may be another reaſon, *viz.* the proceſs of ulceration which goes on in theſe Teeth *, in ſome caſes falling into ſuppuration.

* Vide Natural Hiſtory of the Teeth, for an Explanation of this Proceſs in thoſe Teeth, p. 98, 99.

It ſometimes happens in theſe Gum Boils, that a fungus will puſh out at the orifice, from a luxuriant diſpoſition to form granulations, in the inſide of the abceſs, and the want of power to heal or ſkin; the ſame thing frequently happens in iſſues, where the parts have a diſpoſition to granulate, but have not the power of healing, on account of an extraneous body being kept there. The Tooth in the preſent caſe acts as an extraneous body, and by the ſecretion of matter the abceſs is prevented from healing.

In the treatment of Gum Boils, the practice will be the ſame, whether the abceſs has ariſen from a diſeaſed Tooth, or a diſeaſe in the ſocket.

The Teeth being under ſuch circumſtances in the animal machine, that they cannot partake of all the benefits of a cure in the ſame manner as other parts do; on that account, when an abceſs forms itſelf about the root of a Tooth, the Tooth by loſing its connection with the other parts, loſes every power of union, as it is not endowed with the power of granulating, and thereby it becomes an extraneous body, or at leaſt acts here as an extraneous body, and one of

the

the worſt kind, ſuch as it is not in the power of any operation of the machine to get rid of. This is not the caſe with any other part of the body, for when any other part becomes dead, the machine has the power of ſeparating it from the living, called ſloughing or exfoliation, and expelling it, whence a cure is effected; but in the caſe of Gum Boils, the only cure of them is the extraction of the Tooth. As this is the laſt reſource, every thing is to be done to make the parts as eaſy under the diſeaſe as poſſible, ſo that this operation may be poſtponed.

When the abceſs has opened through the Gum, I believe the beſt method that can be tried with a view to prevent future gatherings, is to prevent the cloſing up of the abceſs; and this may be done, by enlarging the opening, and keeping it enlarged, till the whole internal ſurface of the cavity of the abceſs is ſkinned over, or till the opening in the Gum loſes the diſpoſition to cloſe up, which will in a great meaſure prevent any future formation of matter; or at leaſt whatever is formed will find an eaſy outlet, which will prevent theſe accumulations from taking place ever after. The end of the fang will indeed be hereby expoſed; but, under

under ſuch circumſtances it will not be in a worſe ſituation than when ſoaked in matter.

One method of doing this is to open the Gum Boils by a crucial inciſion, the full width of the abceſs, and fill it well with lint, which ſhould be dipped in lime water, or a diluted ſolution of lunar cauſtic; made by diſſolving one drachm of the cauſtic in two ounces of diſtilled water; and the wound ſhould be dreſſed very frequently, as it is with difficulty that the dreſſing can be kept in. If this is not ſufficient to keep the wound open, it may be touched with the lunar cauſtic, ſo as to produce a ſlough; and this may be repeated, if it ſhould be found neceſſary.

One conſiderable diſadvantage occurs in this practice, which is the difficulty of keeping on the dreſſings; but conſtant attention will make up for the inconvenience of ſituation.

If the ſurface of the abceſs be touched with the lapis ſepticus, and the lip kept from coming in contact with the part for one minute, it anſwers better

than

than any other method; for this, within that ſpace of time, will penetrate to the bottom.

The ſurface of the boil ſhould be firſt wiped dry, as much as the nature of the part will allow, to prevent as much as poſſible the ſpreading of the cauſtic; which by care can be prevented, as the operator will watch it the whole time.

To extract the Tooth, then to file off any diſeaſed part of it, and immediately to replace it, has been practiſed, but often without the deſired ſucceſs; for it has often happened, that a Tooth has been introduced into a diſeaſed jaw. This practice, however, now and then, has ſucceeded.

When a Gum Boil is formed on a back Tooth, or *Molares*, ſuch very nice treatment is not neceſſary, as when it happens to the fore Teeth; becauſe, appearances are there of leſs conſequence; therefore, the gum may be ſlit down upon the fang through its whole length, from the opening of the Gum Boil to its edge, which will prevent any future union; and the whole cavity of the abceſs, ſkinning over, will prevent any future collec-

tion of matter. The wound appears afterwards like the hare lip, and therefore this practice is not adviſeable where it would be much in view; as when the diſeaſe is in the fore Teeth. In theſe caſes, where the granulations puſh out through the ſmall opening, they may be cured by the method above mentioned; but, if it is not complied with, they may be very ſafely cut off with a knife or launcet. However, this does not effect a cure; for they commonly riſe again. To ſlit the gum, in this caſe, has been common, but it is a bad method, whenever the defect is in ſight.

SECT.

SECT. V.

Excreſcences from the Gum.

FROM bad Teeth there are alſo ſometimes excreſcences, ariſing at once out of the Gum; near, or in contact with, the diſeaſed Tooth.

In general they are eaſily extracted with a knife, or whatever cutting inſtrument can be beſt applied; but this will vary according to their ſituations, and the extent of their baſe.

They will often riſe in a day or two after the operation as high as ever; but this newly-generated matter generally dies ſoon, and the diſeaſe terminates well. They have often ſo much of a cancerous appearance, as to deter ſurgeons from meddling with them; but where they ariſe at once from the Gum, and appear

to be the only diſeaſed part, I believe they have no malignant diſpoſition.

However, I have ſeen them with very broad baſes, and where the whole could not be removed, and yet no bad conſequences have attended their removal. Theſe often riſe again in a few years, by which means they become very troubleſome.

After the extirpation of them, it is often neceſſary to apply the actual cautery to ſtop the bleeding; for arteries going to increaſed parts are themſelves increaſed, and alſo become diſeaſed; and have not the contractile power of a ſound artery.

SECT.

SECT. VI.

Deeply-ſeated Abceſſes in the Jaws.

SOMETIMES deeper Abceſſes occur than thoſe commonly called Gum Boils. They are often of very ſerious conſequences, producing carious bones, &c. Theſe commonly ariſe from a diſeaſe in the Tooth, and more eſpecially in the *cuſpidati*; thoſe Teeth paſſing farther into the jaw than the others. Their depth in the jaw being beyond the attachment of the lip to the gum, if an abceſs forms at their points, it more readily makes its way through the common integuments of the face, than between the gum and lip, which diſfigures the face; and when in the lower jaw, looks like the evil.

In the upper jaw it makes a diſagreeable ſcar on the face, about half an inch from the noſe.

Theſe,

Theſe, although they may ſometimes ariſe from diſeaſes of the Teeth and Gums, yet are properly the object of common ſurgery; and the Surgeon muſt apply to the Dentiſt, if his aſſiſtance is neceſſary, to pull out the Tooth, or to perform any other operation which comes under his province.

It ſometimes happens that the abceſs is ſituated ſome way from the root of the diſeaſed Tooth, both in the upper jaw and the lower; but, I think, more frequently in the lower. When it threatens to open externally on the ſkin of the face, great care ſhould be taken to prevent it, and an opening very early made into the ſwelling on the inſide of the lip; for it is generally very readily felt there. This practice of early opening theſe abceſſes upon the inſide of the mouth is more neceſſary, when the abceſs is in the lower jaw, than when in the upper; becauſe matter by its weight always produces ulceration more readily at the lower part. I have ſeen this practice anſwer, even when the matter had come ſo near the ſkin, as to have inflamed it. If it is in the upper, the opening need not be ſo very large; as the matter will have a depending outlet.

To prevent a relapſe of the diſeaſe, it will in moſt caſes be neceſſary to pull out the Tooth; which has either been the firſt cauſe, or has become diſeaſed, in conſequence of the formation of the abſceſs; and in either caſe is capable of reproducing the diſeaſe.

The mouth ſhould be often waſhed; and while the water is within the mouth, the ſkin ſhould be preſſed oppoſite to the abceſs.

If the life of the bone be deſtroyed, it will exfoliate; and very probably two or three of the Teeth may come away with the exfoliation. Little ſhould be done in ſuch caſes, except that the patient ſhould keep the mouth as clean as poſſible by frequently waſhing it, and when the bones exfoliate, they ſhould be removed as ſoon as poſſible. In theſe caſes it is but too common for the Dentiſt to be very buſy, and perhaps do miſchief through ignorance.

SECT.

SECT. VII.

Abceſs of the Antrum Maxillare.

THE *Antrum Maxillare* is very ſubject to inflammation and ſuppuration, by means of diſeaſes of the neighbouring parts, and particularly of the duct leading to the noſe being obliterated. Whether this is the cauſe, or only an effect, is not eaſily determined, but there is great reaſon to ſuppoſe it an attendant, from ſome of the ſymptoms. If it be a cauſe, we may ſuppoſe, that the natural mucus of theſe cavities accumulating, irritates and produces inflammation for its own exit; in the ſame manner as an obſtruction to the paſſage of the Tears through the *ductus ad Naſum*, produces an abceſs of the *lachrymal ſac*.

This inflammation of the *Antrum* gives a pain which will be at the firſt taken for the Tooth-ach, eſpecially if there be a bad Tooth in that ſide; however,

in

in theſe caſes, the noſe is more affected than commonly in a Tooth-ach.

The eye is alſo affected; and it is very common for people with ſuch a diſeaſe to have a ſevere pain in the forehead, where the frontal ſinus's are placed; but ſtill the ſymptoms are not ſufficient to diſtinguiſh the diſeaſe. Time muſt diſcloſe the true cauſe of the pain; for it will commonly continue longer than that which ariſes from a diſeaſed Tooth, and will become more and more ſevere; after which a redneſs will be obſerved on the fore part of the cheek, ſomewhat higher than the roots of the Teeth, and a hardneſs in the ſame place, which will be conſiderably circumſcribed. This hardneſs may be felt rather highly ſituated on the inſide of the lip.

As this diſeaſe has been often treated of by ſurgeons, I ſhall only make the following remarks concerning it.

The firſt part of the cure, as well as of that of all other abceſſes, is to make an opening, but not in the part where it threatens to point; for that would generally be through the ſkin of the cheek.

If the diſeaſe is known early, before it has cauſed the deſtruction of the fore part of the bone, there are two ways of opening the abceſs: one by perforating the partition between the antrum and the noſe, which may be done; and the other by drawing the firſt or ſecond grinder of that ſide, and perforating the partition between the root of the alveolar proceſs and the antrum, ſo that the matter may be diſcharged for the future that way.

But if the fore part of the bone has been deſtroyed, an opening may be made on the inſide of the lip, where the abceſs moſt probably will be felt; but this will be more apt than the other perforation to heal, and thereby may occaſion a new accumulation; which is to be avoided, if poſſible, by putting in practice all the common methods of preventing openings from healing or cloſing up; but this practice will rather prove troubleſome; therefore the drawing the Tooth is to be preferred, becauſe it is not ſo liable to this objection.

CHAP.

CHAP. II.

OF THE

DISEASES of the ALVEOLAR PROCESSES,

AND THE

CONSEQUENCES OF THEM.

HAVING thus far treated of the diſeaſes of the Teeth themſelves, and thoſe of the Sockets and Gums, which either ariſe from them, or are ſimilar to ſuch as ariſe from them, I come now to conſider the diſeaſes which take place primarily in the Sockets, when the Teeth are perfectly ſound: theſe appear to be two; and yet I am not ſure but that they are both fundamentally the ſame, proceeding together from the ſame cauſe, or one depending on the other.

The firſt effect, which takes place, is a waſting of the Alveolar Proceſſes, which are in many people gradually abſorbed, and taken into the ſyſtem. This waſting begins firſt at the edge of the ſocket, and gradually goes on to the root or bottom.

The Gum, which is ſupported by the Alveolar Proceſs, loſes its connection, and recedes from the body of the Tooth, in proportion as the ſocket is loſt; in conſequence of which, firſt the neck, and then more or leſs of the fang itſelf, becomes expoſed. The Tooth of courſe becomes extremely looſe, and at laſt drops out.

The other effect is a filling up of the ſocket at the bottom, whereby the Tooth is gradually puſhed out. As this diſeaſe ſeldom happens without being attended by the other, it is moſt probable that they generally both ariſe from the ſame cauſe. The ſecond in theſe caſes may be an effect of the firſt. Both combine to haſten the loſs of the Tooth; but it ſometimes happens that they act ſeparately: for I have ſeen caſes where the

Gum

Gum was leaving the Teeth, and yet the Tooth was not in the leaſt protruded; on the other hand, I have ſeen caſes, where the Tooth was protruding, and yet the Gum kept its breadth; but where this is not the caſe, and the Gums give way, the Gums generally become extremely diſeaſed; and as they are ſeparated from both the Teeth and the Alveolar Proceſs, there is a very conſiderable diſcharge of matter from thoſe detached ſurfaces.

Though the waſting of the Alveoli at their mouths, and the filling up at their bottoms, are to be conſidered as diſeaſes, when they happen early in life; yet it would appear to be only on account of a natural effect taking place too ſoon; for the ſame thing is very common in old age *: and alſo, as this proceſs of filling up the bottom, and waſting of the mouths of the Alveolar Proceſſes, takes place in all ages, where a Tooth has been drawn, and the connection between the two parts is deſtroyed, this might lead us to ſuſpect, that the original cauſe of theſe diſeaſes may be a want of that perfect harmony, which is

* Vide Natural Hiſtory of the Teeth, page 7.

required

required between the Tooth and Socket, whereby a ſtimulus may be given in ſome degree ſimilar to the loſs of a Tooth; and by deſtroying that ſtimulus upon which the abſorption of the proceſs and the filling up of the ſocket depend, the natural diſpoſition may be reſtored. This laſt opinion is ſtrengthened by the following caſe.

One of the firſt inciſores of the upper jaw of a young lady was gradually falling lower and lower. She was deſirous of having a Tooth tranſplanted, which might better fit the ſhallow ſocket, as it was now become: ſhe conſulted me: I objected to this, fearing that the ſame diſpoſition might ſtill continue; in which caſe the new Tooth would be probably puſhed out in about half a year; that the time ſince the old one began to ſink, and a relief of ſo ſhort a continuance, would be all the advantage gained by the operation; but I obſerved at the ſame time, that the operation might have the effect of deſtroying the diſpoſition to filling up, ſo that the new Tooth might keep its ground. This idea turned the balance in favour of the operation; and it was performed. Time ſhewed that the reaſoning was juſt: the

Tooth

Tooth faſtened; and has kept in its ſituation for ſome years.

Theſe diſeaſes ariſe often from viſible cauſes. Any thing that occaſions a conſiderable and long continued inflammation in thoſe parts, ſuch particularly as a ſalivation, will produce the ſame effect. The ſcurvy alſo, when carried to a great height, attacks the Gums, and the Alveolar Proceſſes, which becomes a cauſe of the diſſolution of thoſe parts. This is moſt remarkable in the ſcurvy at ſea.

When the diſeaſe ariſes from theſe two laſt cauſes, the Gums are either affected with the ſame diſeaſe, together with the Alveolar Proceſſes, or they ſympathize with them. They ſwell, become ſoft and tender; and, upon the leaſt preſſure or friction, bleed very freely.

How far theſe diſeaſes can be prevented and cured, is, I believe, not known.

The practice hath been principally to ſcarify the Gums freely; and this with a view to faſten the Teeth made

made looſe by the diſeaſe, which has therefore generally made a conſiderable progreſs before even an attempt towards a cure has been made. This ſcarification has certainly a good effect in ſome caſes, the Teeth thereby becoming much faſter; but how far the Alveolar Proceſſes have been deſtroyed in ſuch inſtances, cannot be determined. Perhaps, only a general fullneſs of the attaching membrane, between the Tooth and the Proceſs, had taken place, as in a ſlight ſalivation, ſo as to puſh the Tooth a little way out of the bony ſocket; which having ſubſided by the plentiful bleeding, the Tooth of courſe becomes faſt. Or perhaps, by producing an inflammation of another kind, the firſt inflammation, or diſpoſition to inflame, is deſtroyed; which evidently appeared in the caſe of the young lady above mentioned.

If the above practice is unſucceſsful, and the Tooth continues to protrude, it will either become very troubleſome, or a great deformity. A fore Tooth may not, indeed, be at firſt ſo troubleſome as a Grinder; becauſe theſe Teeth frequently *overlop*; but it will be extremely diſagreeable to the eye.

If

If the cauſe cannot be removed, the effect muſt be the object of our attention. To file down the projecting part is the only thing that can be done; but care muſt be taken not to file into the cavity, otherwiſe pain, inflammation, and other bad conſequences, may probably enſue. This practice, however, will be very troubleſome, becauſe it will be difficult to file a looſe Tooth. At laſt the Tooth will drop out, which will put an end to all farther trouble.

If the Alveoli have really been deſtroyed, in thoſe caſes of looſe Teeth which have become firm again, it would be difficult to aſcertain whether they have a power of renewing themſelves, analogous to that power by which they firſt grow; or whether the faſtening be effected by a cloſing of the Gum and Proceſs to the Teeth. When the diſeaſe ariſes from the ſcurvy, the firſt attempt muſt be to cure that diſeaſe; and afterwards the above local treatment may be of ſervice.

Together with drawing blood from the Gums, aſtringents have always been uſed to harden them. But when the diſeaſe does not ariſe from a conſtitutional cauſe, which may be removed, (ſuch as the ſea-ſcurvy or ſalivation) but from a diſpoſition in the

parts themſelves, I have ſeen little relief given by them.

The tincture of myrrh, tincture of Peruvian bark, and ſea-water, are ſome of the applications which have been recommended.

In ſuch caſes I have ſeen conſiderable benefit from the uſe of the tincture of bark and laudanum, in the proportion of two parts of the tincture of bark to one of the laudanum; and this to be uſed frequently, and at each time to be kept in the mouth during ten, fifteen, or twenty minutes.

CHAP.

CHAP. III.

OF THE

DISEASES of the GUMS,

AND THE

CONSEQUENCES OF THEM.

SECT. I.

The Scurvy in the Gums.

(Vulgarly ſo called.)

THE Gums are extremely ſubject to diſeaſes, the ſymptoms of which, in an advanced ſtate of them, are in general ſuch as were deſcribed in the preceding chapter.

They ſwell, become extremely tender, and bleed upon every occaſion; which circumſtances being ſomewhat ſimilar to thoſe obſervable in the true Scurvy, the

diſeaſe has generally been called a Scurvy in the Gums.

But as this ſeems to be the principal way in which the Gums are affected, I ſuſpect, that the ſame ſymptoms may ariſe from various cauſes; as I have often ſeen the ſame appearances in children evidently of a ſcrofulous habit; and have alſo ſuſpected them in grown people: they likewiſe frequently appear in perſons, who are, in all other reſpects, perfectly healthy.

When the Gums firſt begin to have a tenderneſs, we may obſerve it firſt on their edges: the common ſmooth ſkin of the Gum is not continued to its very edge, but becomes at the edge a little rough like a border, and ſomewhat thickened. The part of the Gum, between two Teeth, ſwells, and often puſhes out like luxuriant fleſh, which is frequently very tender.

The inflammation is often carried ſo far as to make the Gums ulcerate; ſo that the Gums in many caſes have a common ulcer upon them; by which proceſs, a part of the Teeth are denuded. This is often on one part only,

only, often only on one jaw; while in ſome caſes it is on the whole Gums on both jaws.

In this caſe it often happens, that the Alveolar Proceſs diſappears, after the manner above deſcribed, *(ſee page 48)* by taking part in the inflammation, either from the ſame cauſe, or from ſympathy. In ſuch caſes there is always a very conſiderable diſcharge of matter from the inſide of the Gum, and Alveolar Proceſs, which always takes the courſe of the Tooth for its exit.

In many of theſe caſes we find, that while the Gums are ulcerating in one part, they are ſwelling and becoming ſpongy in another, and hanging looſe upon the Teeth; and this often takes place, where there is no ulceration in any part.

The treatment, proper in this diſeaſe, where the Gums become luxuriant, from a kind of tumefaction, is generally to cut away all the redundant ſwellings of the Gum. I have ſeen ſeveral inſtances, where this has ſucceeded; but ſtill I am inclined to think, that this is not the beſt practice; for it is not that an adventitious ſubſtance is thus removed, as in the caſe of luxuriant granulations, from a

ſore,

ſore, but a part of the Gum itſelf is deſtroyed, in like manner as a part enlarged by inflammation may be reduced by the knife to its natural ſize; which would certainly be bad practice. I ſhould ſuſpect, that the good, ariſing from ſuch practice, is owing to the bleeding which takes place; eſpecially as I have found from experience, that ſimply ſcarifying the Gums has anſwered the ſame purpoſe. Where there are reaſons for ſuppoſing it to ariſe from a peculiarity in the conſtitution, the treatment ſhould be ſuch as will remove this peculiarity.

If the conſtitution is ſcorbutic, it muſt be treated with a view to the original diſeaſe. If ſcrofulous, local treatment, by wounding the parts, may do harm; but ſea-bathing, and waſhing the mouth frequently with ſea-water, are the moſt powerful means of cure that I know.

SECT.

SECT. II.

Callous Thickenings of the Gums.

THE Gums are alſo ſubject to other diſeaſes, abſtracted from their connection with the Alveoli and Teeth; which do not wholly belong to our preſent ſubject.

A very common one is the thickening of the Gum in ſome particular place, of a hard callous nature, ſimilar to an excreſcence. Many of theſe have a cancerous appearance, which deters the Surgeon from meddling with them; but in general, without reaſon.

They may be often removed by the knife, but not always. The bleeding, which follows, is generally ſo conſiderable, that it is frequently neceſſary to apply the actual cautery.

They

They ſometimes grow again, which ſubjects the patient to the ſame operation. I have known them extracted ſix times; but, in ſuch caſes, I ſuſpect that they really have a cancerous diſpoſition; at leaſt, it has been ſo in two caſes, which have fallen under my obſervation.

But here the ſkill of the Surgeon, rather than that of the Dentiſt, is required.

CHAP.

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CHAP. IV.

OF

NERVOUS PAINS in the JAWS.

THERE is one diſeaſe of the Jaws which ſeems in reality to have no connection with the Teeth, but of which the Teeth are generally ſuſpected to be the cauſe. This deſerves to be taken notice of in this place, becauſe operators have frequently been deceived by it, and even ſound Teeth have ſometimes been extracted through an unfortunate miſtake.

This pain is ſeated in ſome one part of the Jaws. As ſimple pain demonſtrates nothing, a Tooth is often ſuſpected, and is perhaps drawn out; but ſtill the pain continues, with this difference however, that it now ſeems to be in the root of the next Tooth: it is then ſuppoſed either by the patient or the operator, that the wrong Tooth was extracted; wherefore, that

in which the pain now ſeems to be, is drawn, but with as little benefit. I have known caſes of this kind, where all the Teeth of the affected ſide of the Jaw, have been drawn out, and the pain has continued in the Jaw; in others, it has had a different effect, the ſenſation of pain has become more diffuſed, and has at laſt, attacked the correſponding ſide of the tongue. In the firſt caſe, I have known it recommended to cut down upon the Jaw, and even to perforate and cauteriſe it, but all without effect.

Hence it ſhould appear, that the pain, in queſtion, does not ariſe from any diſeaſe in the part, but is entirely a nervous affection.

It is ſometimes brought on, or increaſed, by affections of the mind, of which I once ſaw a remarkable inſtance in a young Lady.

It often has its periods, and theſe are frequently very regular.

The regularity of its periods gives an idea of its being a proper caſe for the bark, which however frequently fails.

I have

I have ſeen caſes of ſome years ſtanding, where the hemlock has ſucceeded, when the bark has had no effect; but ſometimes all attempts prove unſucceſsful. Sea bathing has been in ſome caſes of ſingular ſervice.

CHAP. V.

OF THE

EXTRANEOUS MATTER upon the TEETH.

THERE are parts of the Tooth, which lie out of the way of friction, viz. the angles made by two Teeth, and the ſmall indentation between the Tooth and Gum.

Into theſe places the juices are preſſed and there ſtagnate, giving them at firſt the appearance of being ſtained or dirty. A Tooth in this ſtage is generally clean for ſome way from its cutting edge, towards the gum, on account of the motion of the lips upon it, and the preſſure of the food, &c. It is alſo pretty clean cloſe to the Gum, from the motion of the looſe edge of the Gum upon that part, but this circumſtance is only obſervable in thoſe who have their Gums perfectly ſound; for in others, this looſe edge of

of the Gum is either loſt, or no longer retains its free motion.

If art be not now uſed, as the natural motion of the parts is not ſufficient, the incruſtation encreaſing covers more and more of the Teeth. As maſtication generally keeps that part clear which is near to the edges and grinding ſurfaces; and as the motion of the lips in ſome meaſure retards its growth outwards, it accumulates on the parts above mentioned, till it riſes almoſt as high as the Gum; its growth being now retarded in that direction, it accumulates on the edge next to the Gum, ſo that in time it paſſes over the Gum, of which it covers a greater or leſs portion. When it has encreaſed ſo much as to touch the Gum, (which very ſoon happens, eſpecially in the angle between the Teeth) it produces ulceration of that part, and a train of bad conſequences. Often the Gums receding from this matter, become very tender and ſubject to hemorrhage.

The alveolar proceſſes frequently take part with the Gums, and ulcerate, ſo that the Teeth are left without their ſupport, and at laſt drop out, ſimilarly to the diſeaſes of theſe parts already deſcribed.

All

All our juices contain a conſiderable quantity of calcareous earth, which is diſſolved in them, and which is ſeparated from them upon expoſure, which continues mixed with the mucus; ſo that the extraneous matter conſiſts of earth and the common ſecreted mucus *.

This diſpoſition of the juices of the mouth to abound ſo much with earth, ſeems to be peculiar to ſome people, perhaps to ſome conſtitutions; but I have not been able to aſcertain what theſe are. We find perſons who ſeem to have nothing particular, either in conſtitution or way of life, ſo ſubject to this accumulation, that the common methods of prevention, ſuch as waſhing and bruſhing the Teeth, have not the deſired effect.

The diſpoſition is ſo ſtrong in ſome people, that the concretion forms on the whole body of the Tooth; I have ſeen it even on the grinding ſurface of the *molares*, and often two or three Teeth are cemented together with it. This I think could only happen to

* Vide Natural Hiſtory, page 125, in the Note, for a further deſcription of this.

thoſe

thoſe who ſeldom or never uſe theſe Teeth. It is very apt to accumulate on a Tooth the oppoſite of which is loſt.

I once ſaw a caſe of this kind, where the accumulation, which was on a grinder, appeared like a tumour on the inſide of the mouth, and made a riſing in the cheek, which was ſuppoſed by every one that felt it, to be a ſcirrhous tumour forming on the cheek; but it broke off and diſcovered what it was.

This accumulation is very apt to begin during a fit of ſickneſs, when the extraneous juices are allowed to reſt; and perhaps the juices themſelves may have at this time a greater tendency to produce the incruſting matter.

It may alſo ariſe from any circumſtance, which prevents a perſon from eating ſolids, whereby the different parts of the mouth have leſs motion on each other. Lying-in women are inſtances of this; not to mention that the aſſiſtance of art in keeping the Teeth clean is commonly wanting under ſuch circumſtances.

The

The adventitious ſubſtance, as was ſaid before, is compoſed of mucus or animal juices, and calcareous earth; the earth is attached to and cryſtalized upon the Tooth, and the mucus is intangled in theſe cryſtals.

The removal of this adventitious matter, is a part in which the dentiſt ought to be very cautious; he ſhould be perfectly maſter of the difference between the natural or original Tooth, and the adventitious matter; and he ſhould be ſenſible of the propriety of ſaving as much as poſſible of the Tooth, and at the ſame time take pains to remove all that which is not natural. Many perſons have had their teeth wholly ſpoiled by an injudicious treatment of them in this reſpect.

As the cauſe of this incruſtation is not either a known diſeaſe of the conſtitution, or of the parts, but depends on a property of the matter, ſecreted, ſimply as inanimate matter; the remedy of courſe becomes either mechanical or chemical.

The

The mechanical remedies are friction, filing, and picking. The firſt is ſufficient, when the Teeth are only beginning to be diſcoloured; or, when already clean, they may be thus kept clean. Various are the methods propoſed; to waſh them with cold water, and at the ſame time to rub them with a piece of cloth on the fore-finger, has been thought ſufficient by ſome; others have recommended the duſt of a burnt cork, burnt bread, &c. with a view to act with more power on the adventitious matter, than what can be applied by the means of a ſoft bruſh or cloth.

In caſes where this incruſtation has been more conſiderable, powders of various kinds have been employed, ſuch as tartar, bole, and many others.

Cream of tartar is often uſed, which at the ſame time that it acts mechanically, has likewiſe a chymical power, and diſſolves this matter.

Other mechanical means are inſtruments to pick, ſcrape, and file off the calcarious earth; theſe ſhould only be made uſe of when it is in large quantities, and

with great caution, as the Teeth may be ſomewhat looſe; or, a part of the Tooth may be broken off with the incruſtation.

The chymical means are ſolvents: theſe are either alkalies or acids; the alkaline ſalt will anſwer very well early in the diſeaſe; for the cruſt in the firſt ſtage conſiſts chiefly of mucus, which the alkali will remove very readily; but it ſhould not be uſed too freely, as it rather ſoftens the Gums, and makes them extremely tender.

Acids are alſo employed with ſucceſs, as they diſſolve the earth, but are attended with this diſadvantage, that they act with more force upon the Tooth itſelf, diſſolving part of it, which is to be avoided, if poſſible; for no part of a ſound Tooth can be ſpared.

We may obſerve that people who eat a good deal of ſalad or fruit, have their Teeth much cleaner than common; which is owing to the acids in thoſe fruits; and for the ſame reaſon people's Teeth are commonly cleaner in ſummer than winter, in thoſe countries where there

there is a great plenty of fruit. When the accumulation has been considerable, the Teeth and Gums will feel tender on the removal of this matter, and even be affected by cold air; but this will not be of long continuance.

CHAP. VI.

OF THE

IRREGULARITY of the TEETH.

AS that part of each jaw, which holds the ten fore-teeth, is exactly of the ſame ſize when it contains thoſe of the firſt ſet, as when it contains thoſe of the ſecond; and as theſe laſt often occupy a much larger ſpace than the firſt *, in ſuch caſes the ſecond ſet are obliged to ſtand very irregularly.

This happens much oftner in the upper-jaw, than in the lower; becauſe, the difference of the ſize of the two ſets is much greater in that jaw.

* Vide Natural Hiſtory, p. 101, 102. Pl. 6. fig. 2.

This

This irregularity is obſerved almoſt ſolely in the inciſores and cuſpidati; for they are the only Teeth which are larger than their predeceſſors.

It moſt frequently happens to the cuſpidati, becauſe they are often formed later than the bicuſpedes; in conſequence of which, the whole ſpace is taken up before they make their appearance: in ſuch caſes they are obliged to ſhoot forwards or outwards over the ſecond inciſor. However, it frequently happens to the inciſores, but ſeldom to ſuch a degree. This ariſes often from the temporary cuſpidatus of one or both ſides ſtanding firm. I have ſeen the irregularities ſo much as to appear like a double row.

The bicuſpedati generally have ſufficient room to grow, becauſe even more ſpace, than what they can occupy, is kept for them by the temporary grinders *. This however is not univerſally the caſe; for I have ſeen where the bicuſpidati were obliged to grow out of the circle, very probably from their being later in growing than common.

* Vide Natural Hiſtory, page 83.

That

That it is from want of room in the jaw, and not from any effect that the firſt ſet produce upon them is evident; firſt, becauſe in all caſes of irregularity we find that there is really not room in the Jaw, to allow of placing all the Teeth properly in the circle; ſo that ſome are neceſſarily on the outſide of the circle, others within it, while others are turned with their edges obliquely as it were, warped; and ſecondly, becauſe the bicuſpides are not out of the circle, although they are as much influenced by the firſt ſet as any of the others.

As they are not influenced by the firſt ſet, it cannot be of any ſervice to draw the firſt poſſeſſor; for that gives way in the ſame proportion as the other advances. As the ſucceeding Tooth however is broader, it often interferes with a ſhedding Tooth next to it, the fang of which not being influenced by the growth of its own ſucceeding Tooth, it does not decay in proportion as the other advances, and therefore the drawing of the adjoining ſhedding Tooth is often of ſervice *.

* Vide Nat. Hiſt. page 107.

In

In caſes of conſiderable irregularity for want of room, a principal object is to remove thoſe which are moſt out of their place, and thereby procure room for the others which are to be brought into the circle.

To extract an irregular Tooth would anſwer but little purpoſe, if no alteration could be made in the ſituation of the reſt; but we find that the very principle upon which Teeth are made to grow irregularly, is capable, if properly directed, of bringing them even again. This principle, is the power which many parts (eſpecially bones) have of moving out of the way of mechanical preſſure.

The irregularity of the Teeth is at firſt owing to mechanical preſſure; for one Tooth getting the ſtart of another, and fixing firmly in its place, becomes a reſiſtance to the young, looſe, forming Tooth, and gives it an oblique direction. The ſame principle takes place in a completely formed Tooth, whenever a preſſure is made upon it. Probably a Tooth might by ſlow degrees be moved to any part of the mouth, for I have ſeen the cuſpedati preſſed into the place of the inciſores.

ciſores. However it is obſerved, that the Teeth are eaſier moved backwards than forwards, and when moved back that they are permanent, but often, when moved forwards, that they are very apt to recede.

The beſt time for moving the Teeth is in youth, while the jaws have an adapting diſpoſition; for, after a certain time, they do not ſo readily ſuit themſelves to the irregularity of the Teeth. This we ſee plainly to be the caſe, when we compare the loſs of a Tooth at the age of fifteen years, and at that of thirty or forty. In the firſt caſe we find, that the two neighbouring Teeth approach one another, in every part alike, till they are cloſe; but in the ſecond, the diſtance in the jaw, between the two neighbouring Teeth, remains the ſame, while the bodies will in a ſmall degree incline to one another from want of lateral ſupport *.

And this circumſtance of the bodies of the Teeth yielding to preſſure upon their baſe, ſhews that, even in the adult, they might be brought nearer to one another by art properly applied.

* Vide Nat. Hiſt. Plate XVI. fig. 1. *a*, *b*, *c*.

As

As the operation of moving the Teeth is by lateral preſſure upon their bodies, theſe bodies muſt firſt have paſſed through the gum ſufficiently for a hold to be taken.

The beſt time ſeems to be, when the two grinders of the child have been ſhed; for at this time a natural alteration is taking place in that part of the jaw.

The means of making this preſſure I ſhall only ſlightly deſcribe, as they will greatly vary according to circumſtances, ſo conſiderably indeed, that ſcarcely two caſes are to be treated alike, and in general the dentiſts are tolerably well acquainted with the methods.

In general, it is done with ligatures or plates of ſilver. The ligatures anſwer beſt when it is only required to bring two Teeth cloſer together, which are pretty much in the circle. The trouble attending this is but trifling, as it is only that of having them tied once a week or fortnight.

Where Teeth, growing out of the circle, are to be brought into it, curved ſilver plates, of a proper con-

ſtruction, muſt be uſed. Theſe are generally made to act on three points, two fixed points on the ſtanding Teeth, and the third on the Tooth which is to be moved. That part of the plate, which reſts on the two ſtanding Teeth, muſt be of a ſufficient length for that purpoſe, while the curved part is ſhort, and goes on the oppoſite ſide of the Tooth to be moved. Its effect depends very much on the attention of the patient, who muſt frequently preſs hard upon it with the Teeth of the oppoſite jaw; ſo that this method is much more troubleſome to the patient than the ligature.

It is impoſſible to give abſolute directions what Tooth or Teeth ought to be pulled out. That muſt be left to the judgment of the operator; but the following general hints may be of ſervice.

1. If there is any one Tooth very much out of the row, and all the others regular, that Tooth may be removed, and the two neighbouring ones brought cloſer together.

2. If there are two or more Teeth of the ſame ſide very irregular, (as for inſtance, the ſecond inciſor and cuſpi-

cuſpidatus) and it appears to be of no conſequence, with reſpect to regularity, which of them is removed, I ſhould recommend the extraction of the fartheſt back of the two, viz. the cuſpidatus; becauſe, if there ſhould be any ſpace, not filled up, when the other is brought into the row, it will not be ſo readily ſeen.

3. If the above-mentioned two Teeth are not in the circle, but ſtill not far out of it, and yet there is not room for both; in ſuch a caſe I would recommend the extraction of the firſt bicuſpis, although it ſhould be perfectly in the row, becauſe the two others will then be eaſily brought into the circle; and, if there is any ſpace left, it will be ſo far back as not to be at all obſervable.

The upper jaw is often rather too narrow from ſide to ſide, near the anterior part which ſupports the fore Teeth, and projects forwards conſiderably over the lower, giving the appearance of the rabbit-mouth, although the Teeth be quite regular in the circle of the jaw.

In ſuch a caſe it is neceſſary to draw a bicuſpis of each ſide, by which means the forepart of the circle

will fall back; and if a croſs bar was to be ſtretched from ſide to ſide acroſs the roof of the mouth, between cuſpis and cuſpis, it would widen the circle. The fore Teeth might alſo be tied to this bar, which would be a means of aſſiſting nature in bringing them back. This has been practiſed, but it is troubleſome.

As neither the bodies nor the fangs of the Teeth are perfectly round, we find that this circumſtance often becomes a cauſe of their taking a twiſt; for, while growing, they may preſs with one edge only on the completely formed Tooth; by which means they will be turned a little upon their center.

The alteration of theſe is more difficult than of the former, for it is, in general, impoſſible to apply, ſo long and conſtantly as is neceſſary for ſuch an operation, any preſſure that has the power of turning the Tooth upon its center. However, in the inciſores, it may be done by the ſame powers which produce the lateral motion; but where theſe cannot be applied, as is frequently the caſe, the Tooth may be either pulled out entirely, and put in again even, or it may be twiſted

twiſted round ſufficiently to bring it into a proper poſition, as hath been often practiſed.

It may not be improper, in this place, to take notice of a caſe which frequently occurs. It is a decay of the firſt adult grinder at an early age, viz. before the temporary grinders are ſhed, and before the ſecond grinder of the adult has made its appearance through the gum. In this caſe, I would recommend removing the diſeaſed Tooth immediately, although it may occaſion no kind of trouble; for, if it be drawn before the temporary grinders are ſhed, and before the ſecond adult grinder has cut the gum, it will in a ſhort time not be miſſed; becauſe the bicuſpis of that ſide will fall a little back, and the ſecond and third grinders will come a little forward; by which means the ſpace will be filled up, and theſe Teeth will be well ſupported. Beſides, the removal of this Tooth, will make room for the fore Teeth, which is often very much wanted, eſpecially in the upper jaw.

CHAP. VII.

OF

IRREGULARITIES between the TEETH and JAW.

CERTAIN diſproportions, between the Teeth and Jaw, ſometimes occur, one of which is, when the body of the lower jaw is not of ſufficient length for all the Teeth. In ſuch caſes, the laſt grinder never gets perfectly from under the coronoide proceſs, its anterior edge only being uncovered; and the gum, which ſtill in part lies upon the Tooth, is rubbed againſt the ſharp points of the Tooth, and is often ſqueezed between the Tooth upon which it lies, and the correſponding one of the upper jaw. This occaſions ſo much uneaſineſs to the patient, that it becomes neceſſary to relieve the gum, if poſſible, by dividing it freely in ſeveral places, that it may ſhrink and leave this ſurface of the Tooth wholly uncovered. If this does not anſwer, which is ſometimes the caſe, it is adviſeable to draw the Tooth.

Some

Sometimes, although but ſeldom, an inconvenience ariſes from the dentes ſapientiæ being in the upper Jaw, and not in the lower; theſe Teeth preſſing upon the anterior part of the root of the coronoide proceſs, when the mouth is ſhut; for the coronoide proceſſes are farther forwards in ſuch caſes, than when the lower Jaw alſo has its dentes ſapientiæ; in ſhort, the exact correſpondence between the two Jaws is not kept up.

In ſuch caſes I know of no other remedy, but the extraction of the Tooth.

OF

SUPERNUMERARY TEETH.

WHEN there are Supernumerary Teeth *, it will, in general, be proper to have them drawn; for they are commonly either troubleſome, or diſfigure the mouth.

* Vide Natural Hiſtory, page 105.

CHAP.

CHAP. VIII.

Of the UNDER JAW.

IT is not uncommon to find the lower Jaw projecting too far forwards, ſo that its fore Teeth paſs before thoſe of the upper Jaw, when the mouth is ſhut*; which is attended with inconvenience, and disfigures the face.

This deformity can be greatly mended in young people. The Teeth in the lower Jaw can be gradually puſhed back in thoſe, whoſe Teeth are not cloſe, while thoſe in the upper can be gently brought forward; which is by much the eaſieſt operation.

Theſe two effects are produced by the ſame mechanical powers. While this poſition of the Jaw is only in a ſmall degree, ſo that the edges of the under

* Vide Natural Hiſtory, page 70.

Teeth

Teeth can be by the patient brought behind thoſe of the upper, it is in his own power to encreaſe this, till the whole be completed; that is, till the grinders meet; and it is not neceſſary to go farther. This is done by frequently bringing the lower Jaw as far back as he can, and then ſqueezing the Teeth as cloſe together as poſſible.

But when it is not in the perſon's power to bring the lower Jaw ſo far back, as to allow the edges of its fore Teeth to come behind thoſe of the upper, artificial means are neceſſary.

The beſt of theſe means is an inſtrument of ſilver, with a ſocket or groove ſhaped to the fore Teeth of the lower jaw to receive them, ſo as to become faſt to them, and ſloped off as it riſes to its upper edge, ſo as to riſe behind the fore Teeth in the upper jaw in ſuch a manner, that, upon ſhutting the mouth, the Teeth of the upper jaw may catch the anterior part of the ſlanting ſurface, and be puſhed forward with the power of the inclined plane. The patient, who wears ſuch an inſtrument, muſt frequently ſhut his mouth with this view.

Theſe need not be continued longer than till the edges of the lower Teeth can be got behind thoſe of the upper; for it is then within the power of the patient, as in the firſt ſtated caſe.

CHAP.

CHAP. IX.

OF

DRAWING the TEETH.

THE extraction of Teeth is, in ſome caſes, an operation of conſiderable delicacy, and, in others, no operation is leſs difficult.

As this is often not thought of till an inflammation has come on, it becomes an object of conſideration whether it be proper to remove the Tooth while that inflammation continues, or to wait till it has ſubſided. I am apt to believe it is better to wait even till the parts have perfectly recovered themſelves, becauſe the ſtate of irritation renders them more ſuſceptible of pain. The contrary practice might alſo appear reaſonable, for by removing the Tooth it might be imagined that we ſhould remove the cauſe; but

when the inflammation has once begun, the effect will go on independently of the cauſe; and to draw the Tooth, in ſuch a ſituation, is rather to produce a freſh cauſe, than to remove the preſent. Of this I think an inſtance has occurred to me. However, moſt Teeth are drawn in the height of inflammation; and, as we do not find any miſchief from the operation, it is perhaps better to do it when the reſolution of the patient is the greateſt. The ſenſibility of the mind may even be leſs at this time.

Teeth are eaſy or difficult of extraction, according as they are faſt or looſe in their ſockets; in ſome degree according to the kind of Tooth, and alſo, in ſome degree, with reference to their ſituation *.

They are naturally ſo faſt as to require inſtruments; and the moſt cautious and dextrous hand; and yet are ſometimes looſe enough to be pulled out by the fingers.

When the ſockets and gums are conſiderably decayed, and the Tooth or Teeth very looſe, it would in

* For farther directions, vid. Nat. Hiſt. page 122.

moſt

moſt caſes be right to perform extraction; for when they are allowed to ſtay, and perhaps are kept in their proper place by being tied to the neighbouring Teeth, they then act upon the remaining gum and ſocket as extraneous bodies, producing ulceration there, and making thoſe parts recede much farther than they naturally would have done, if the Tooth had been drawn earlier; which produces two bad effects, it weakens the lateral ſupport of the two neighbouring Teeth, and it renders it more difficult to fix an artificial Tooth. But unleſs theſe two laſt circumſtances are forcibly impreſſed upon the patient, it is hardly poſſible to perſuade him to conſent to the loſs of a Tooth while it has any hold, eſpecially a tooth which appears ſound.

The extraction ſhould never be done quick; for this often occaſions great miſchief, breaking the Tooth or jaw; on the ſame principle, as a bullet, going againſt an open door with great velocity, will paſs through it, but, with little velocity, will ſhut it.

This

This caution is moſt neceſſary in adults, or in the permanent Teeth *; for, in young ſubjects, where there are only the temporary Teeth †, the jaw, not being ſo firm, the Tooth is not in much danger of being broken ‡.

It is a common practice to divide the gum from the Tooth before it is drawn, which is attended with very little advantage; becauſe at beſt it can only be imperfectly done, and that part of the gum, which adheres to the Tooth, decays when it is loſt. But if ſuch a ſeparation, as can be made, ſaves any pain in the whole of the operation, I ſhould certainly recommend it; and at leaſt in ſome caſes, it might prevent the gum from being torn. It is alſo a common practice, to cloſe the gum as it is termed; this is more for ſhew than uſe; for the gum cannot be made ſo cloſe as to unite by the firſt intention; and therefore the cavity

* Vide Natural Hiſtory, page 83.

† Vide Nat. Hiſt. page 98, fig. XV.

‡ I muſt do Mr. Spence the juſtice to ſay, that this method appears to be peculiar to him, and that he is the only operator I ever knew, who would ſubmit to be inſtructed, or even allow an equal in knowledge; and I muſt do the ſame juſtice to both his ſons.

from

from which the Tooth came, muſt ſuppurate like every other wound. But, as the ſenſations of theſe parts are adapted to ſuch a loſs; and, as a proceſs very different from that which follows the loſs of ſo much ſubſtance in any other part of the body, is to take place; the conſequent inflammations and ſuppurations are not ſo violent *. We may be allowed to call this a natural operation which goes on in the gum and alveoli, and not a violence; as we ſee that the delivery of a young animal before its time, which is ſimilar to the drawing of a fixed Tooth, in happening before all the containing parts are prepared for the loſs, produces conſiderable local violence, without doing proportionable miſchief. Therefore, in general it is very unneceſſary to do any thing at all to the gum.

There are ſome particular circumſtances, which naturally, and others which accidentally attend and follow the drawing of Teeth; but they are in general of no great conſequence.

* Vide Natural Hiſtory, on decay of the Alveoli, page 7.

Bleed-

There follows a bleeding from the veſſels of the ſocket, and thoſe paſſing between it and the Teeth †. This commonly is but trifling; however inſtances have occurred, where it has been very conſiderable, and the aukwardneſs of the ſituation makes it very difficult to ſtop it. In general it will be ſufficient to ſtuff the ſocket with lint, or lint dipped in the oil of turpentine, and to apply a compreſs of lint, or a piece of cork thicker than the bodies of the adjacent Teeth, ſo that the Teeth in the oppoſite jaw may keep up a preſſure.

It has been adviſed to ſtuff into the ſocket ſome ſoft wax, on a ſuppoſition that it would mould itſelf to the cavity, and ſo ſtop the bleeding; this perhaps may ſometimes anſwer better than the other method, and therefore ſhould be tried when that fails.

It is ſcarcely poſſible to draw ſome Teeth without breaking the alveolar proceſſes. This in general is but of little conſequence, becauſe from the nature of the union between the Teeth and ſockets, theſe laſt can ſcarcely be broken farther than the points of the fang,

† Vide Natural Hiſtory, page 41, 42, 43. Pl. XII.

and

and in very few caſes ſo far; therefore little miſchief can enſue, as the fracture extends no farther than the part of the ſocket which will naturally decay after the loſs of the Tooth; and that part, which does not decay, will be filled up as a baſis for the gum to reſt upon. It has been ſuppoſed that the ſplinters do miſchief. I very much doubt this; for if they are not ſo much detached as to loſe the living principle, they ſtill continue part of our body, and are rounded off at their points as all ſplinters are in other fractures, and particularly here, for the reaſons already aſſigned, viz. becauſe this part has a greater diſpoſition for waſting. And if they are wholly detached, they will either come away before the gum contracts entirely; or, after it is cloſed, will act as an extraneous body; form a ſmall abceſs in the gum; and come out.

It ſometimes happens, that the Tooth is broken, and its point, or more of the fang is left behind, which is very often ſufficient to continue the former complaints; and therefore it ſhould be extracted, if it can be done, with care. If it cannot be extracted, the gum will in part grow over it; and the Alveoli

will decay as far as where it is. The decaying principle of the ſocket will produce the diſpoſition to fill up at the bottom, whereby the ſtump will be puſhed out; but, perhaps, not till it has given ſome fits of the Tooth-ach. However, this circumſtance does not always become a cauſe of the Tooth-ach.

TRANSPLANTING TEETH.

ALTHOUGH this operation is in itſelf a matter of no difficulty, yet, upon the whole, it is one of the niceſt of all operations, and requires more chirurgical and phyſiological knowledge than any that comes under the care of the dentiſt. There are certain cautions neceſſary to be obſerved, eſpecially if it be a living Tooth which is to be tranſplanted; becauſe in that caſe it is meant to retain its life, and we have no great variety of choice. Much likewiſe depends upon the patient: he ſhould apply early, and give the dentiſt all the time he thinks neceſſary to get a ſufficient number of Teeth that appear to be of a proper ſize, &c. Likewiſe

wiſe he muſt not be impatient to get out of his hands before it is adviſeable.

The *inciſores*, *cuſpidati*, and *bicuſpides*, can alone be changed, becauſe they have ſingle fangs. The ſucceſs is greateſt in the *inciſores* and *cuſpidati* than the *bicuſpides*; theſe laſt having frequently the ends of their fangs forked, from which circumſtance the operation will become leſs perfect.

It is hardly poſſible to tranſplant the grinders, as the chance of fitting the ſockets of them is very ſmall. When indeed a grinder is extracted, and the ſocket ſound and perfect, the dentiſt may, perhaps, be able to fit it by a dead Tooth.

OF THE STATE of the GUMS and SOCKETS.

THE firſt object of attention is the Sockets and Gums of the perſon who is to have the freſh Tooth. If the

Tooth, which is to be removed, be not wholly diſeaſed, there is great probability that the Socket will be as ſound and complete as ever; but if the body of the Tooth has been deſtroyed ſome time, and the fang has been in the ſtate of what is commonly called a ſtump, it has moſt probably begun to decay on its outer ſurface and point; in which caſe the Socket will be filled up in the ſame proportion; if ſo, there is no poſſibility of ſucceſs. But as in the operation of tranſplanting, the diſeaſed Tooth is to be firſt drawn, it will ſhew the ſtate of the Socket; and the Scion * Tooth is to be left or drawn, according to the appearance on the diſeaſed one.

If the appearance be not favourable, and it therefore be not probable that the Scion Tooth can be introduced, ſo as to unite in the place of the ſtump, I would recommend to every dentiſt to have ſome dead Teeth at hand, that he may have a chance to fit the

* As the tranſplanting of Teeth is very ſimilar to the ingrafting of trees, I thought that term might be transferred from gardening to ſurgery, finding no other word ſo expreſſive of the thing.

Socket. I have known theſe ſometimes laſt for years, eſpecially, when well ſupported by the neighbouring Teeth. Indeed this very practice is recommended by ſome dentiſts in preference to the other. But even this ſhould not be attempted, unleſs the Socket is ſound and pretty large, as the Tooth can otherwiſe have but very little hold.

Whenever there are Gum Boils, I would not recommend tranſplanting, as there is always in ſuch caſes a diſeaſed Socket, although the diſeaſe has originated in the Tooth. In one or two inſtances, indeed, which I have ſeen, the Boil has been cured by ſuch an operation.

If the Gums are diſeaſed, and become ſpongy, as has been deſcribed, it will be very improper to tranſplant, as there will be but little chance of ſucceſs; alſo, if the Sockets have a diſpoſition to waſte, and the Tooth becomes in ſome degree looſe; in ſhort, the Sockets and Gums ſhould be perfectly ſound. No perſon ſhould have a Tooth tranſplanted, while taking mercury, even although the Gums are not affected by it

at

at the time; for they may become affected by that medicine before the Tooth is fixed. I would carry this ſtill farther: no one ſhould have a Tooth tranſplanted, who has any complaint that may ſubject him to the taking of mercury before the Tooth is well fixed. For this reaſon, thoſe who have Teeth tranſplanted, ought particularly to avoid for ſome time the chance of contracting any complaint, for the cure of which mercury may be neceſſary.

I would not recommend tranſplanting, even where mercury has been taken lately. How ſoon mercury may be taken after a Tooth has been tranſplanted, is not eaſily aſcertained. I have known it fail from this cauſe, (as it ſeemed) after ſix weeks, where there was every reaſon to ſuppoſe that it might have been attended with ſucceſs.

Of the Age of the Perſon who is to have the SCION TOOTH.

THE Socket ſhould be of its full ſize, and one or two grinders on each ſide of each jaw ſhould be full grown,

grown, to keep the two jaws at a proper diſtance, which will allow the tranſplanted Tooth to be undiſturbed by the motion of the jaw while faſtening. This will be at the age of eighteen or twenty years.

It ſometimes, however, happens, that a fore Tooth decays before this age, and even before it is completely formed; and therefore all the above mentioned advantages cannot be had. In ſuch caſes, it is not very material whether tranſplanting is practiſed or not, as ſimply to draw the diſeaſed Tooth, will in moſt caſes be ſufficient; for the two neighbouring Teeth may be brought together, ſo as to fill up the ſpace, the others following in a leſs degree, as has been already obſerved upon irregularities of the Teeth.

OF THE SCION TOOTH.

THE Scion Tooth, or that which is to be tranſplanted, ſhould be a full grown young Tooth: young, becauſe

becauſe the principle of life and union is much ſtronger in ſuch than in old ones.

It will be ſcarcely neceſſary to obſerve, that the new Teeth ſhould always be perfectly ſound, and taken from a mouth which has the appearance of that of a perſon ſound and healthy; not that I believe it poſſible to tranſplant an infection of any kind from the circulating juices; although we know from experience that it may be done by a matter ſecreted from them. The Scion Tooth ſhould be leſs than what the Tooth was, the place of which it is to ſupply. This cannot at firſt be known with certainty, but it may in moſt caſes be nearly aſcertained; and that is by judging from the ſizes of the bodies of the two Teeth; but as the fangs do not always bear an exact proportion to the body, it ſometimes happens that this method fails. Alſo it is not always in our power to judge after this manner; for in ſome caſes the body of the Tooth of the perſon who is to have one tranſplanted, ſhall be quite deſtroyed, the fang only remaining: in theſe caſes we muſt judge from its correſpondent on the oppoſite ſide; but even that Tooth is ſometimes deſtroyed.

It

It has been ſuppoſed, that we run no riſk by taking the Scion Tooth from a young ſubject; but this is no ſecurity, for a compleat Tooth is of the ſame ſize in the young as the old.* To remedy this inconvenience as much as poſſible, the Scion Tooth ſhould be that of a female, for female Teeth are in general ſmaller than thoſe of men; but the inconvenience ſtill remains, whenever a female is the ſubject of this operation. Some women have ſuch ſmall Teeth, that it is almoſt impoſſible to fit them. When the fang of the Scion Tooth is larger than that which it is intended to ſupply, it muſt be made ſmaller, and only in that part where it exceeds. But the neceſſity of this ſhould be avoided, if poſſible; for a Tooth that is filed has loſt all thoſe inequalities which allow it to be held much faſter. If, however, ſome part muſt be removed, it ſhould be done ſo as to imitate the old Tooth as much as poſſible. The beſt remedy is to have ſeveral people ready, whoſe Teeth in appearance are fit; for if the firſt will not anſwer, the ſecond may. I am perſuaded this operation has failed, from a Tooth being

* Vide Natural Hiſtory, page 110, on the Growth of Teeth.

forced in too tight; for let us reflect what must be the consequence of such practice. A part of the soft covering of the Tooth, or lining of the Socket, is squeezed between two hard bones, so that all circulation of juices is prevented; a mortification in that part takes place; and in consequence of that a Gum Boil, and the loss of all union between Tooth and Socket; so that the Tooth drops out.

It will be hardly necessary to mention, that the sooner the Scion Tooth is put into its place the better, as delay will perpetually lessen the power upon which the union of the two parts depends *.

* Vide Nat. Hist. of Teeth, page 126, 127, and 128, for an explanation of the principle upon which the success of this operation depends.

Of

Of replacing a ſound TOOTH, when drawn by miſtake.

IT ſometimes happens, that a Tooth is drawn on an idea that it is diſeaſed, becauſe it gives pain, but appears after the extraction to be perfectly ſound. In ſuch a caſe I would recommend the replacing it, that there may be no loſs by the operation; and the ſeat of the pain will probably be removed to the next Tooth. A Tooth beat out by violence, ſhould be replaced in the ſame manner. This ought to be done as ſoon as poſſible; however, I would even recommend the experiment twenty-four hours after the accident, or as long as the Socket will receive the Tooth, which may be for ſome days.

If the Tooth be replaced at any time before its life is deſtroyed, it will re-unite with the cavity of the Socket, and be as faſt as ever.

No Tooth is excepted from this practice; for although in the Grinders there are more fangs than one, yet

theſe fangs will as readily go into their reſpective Sockets as one fang would; and moſt probably when the Tooth has been beat out, the Sockets are enlarged by their giving way.

However, the Grinders are not ſo ſubject to ſuch accidents as the fore Teeth, both from their ſituation, and from their firmneſs in the Sockets.

Where a Tooth has been only looſened, or ſhoved out in part, the patient muſt not heſitate, but replace it immediately. As a proof of the ſucceſs to be expected from replacing Teeth, I will relate the following caſe.

A gentleman had his firſt *bicuſpis* knocked out, and the ſecond looſened. The firſt was driven quite into his mouth, and he ſpit it out upon the ground; but immediately picked it up, and put it into his pocket. Some hours afterwards he called upon me, mentioned the accident, and ſhewed me the Tooth. Upon examining his mouth, I found the ſecond *bicuſpis* very looſe, but pretty much in its place. The Tooth, which had been knocked out, was not quite dry, but very dirty, having dropped on the ground, and having been ſome time in

his

his pocket. I immediately put it into warm water, let it ſtay there to ſoften, waſhed it as clean as poſſible, and then replaced it, firſt having introduced a probe into the Socket to break down the coagulated blood which filled it. I then tied theſe two Teeth to the firſt grinder, and the *cuſpidatus* with ſilk, which was kept on ſome days, and then removed. After a month they were as faſt as any Teeth in the head; and, if it were not for the remembrance of the circumſtances above related, the gentleman would not be ſenſible that his Teeth had met with any accident. Four years have now paſſed ſinee it happened.

Of tranſplanting a dead TOOTH.

THE inſertion of a dead Tooth has been recommended, and I have known them continue for many years. If this always ſuceeded as well as the living, I would give it the preference, becauſe we are much more certain of matching them, as a much greater variety of dead Teeth can be procured than of living ones. But they do not always retain their colour, but are ſuſceptible of ſtain. However, I have known them laſt for years without any alteration; and ſome have appeared

peared rather to acquire a tranſparency, which dead Teeth in general have not.

Of the immediate faſtening of a tranſplanted TOOTH.

WHEN a Tooth has been tranſplanted, the next thing to be done is to fix it in that poſition in which it is intended to remain; that is in general to the two neighbouring Teeth, by means of ſilk or ſea weed. If it is an *inciſor* or *cuſpidatus*, the ſilk ſhould firſt be tied to the neck of one of the neighbouring Teeth, as near the gum as poſſible; then the two ends of the ſilk ſhould be brought round upon the body of the Scion Tooth, but not ſo near the gum as in the former, and tied there; then it ſhould be brought round the neck of the other neighbouring Tooth, as near the gum as poſſible, as in the firſt, and tied there. The reaſon of the difference of the heights of the ſilk recommended, muſt appear evident, it being our intention to keep the Tooth cloſe to the bottom of the Socket.

If the tranſplanted Tooth be a *bicuſpis*, the ſame mode of tying may be followed; but the ſilk may be brought over its grinding ſurface between the two points, by which

which it will be better confined than in any other way. It ſometimes happens, that the body of the Scion Tooth is either too long, too thick, or in ſuch a poſition as to be preſſed upon by the Teeth of the oppoſite jaw. Great care ſhould be taken to prevent this, as the oppoſite Teeth conſtantly oppoſe the faſtening of thoſe which are tranſplanted, in every motion of the jaw. To remedy this inconvenience, we have recommended ſmaller Teeth than thoſe loſt; but even when they are of a proper ſize in other reſpects, they ſhall in ſome caſes ſtill touch the oppoſite Teeth. When this ariſes from length of the Tooth, a ſmall portion may be filed off from the cutting edge with great ſafety. If it is owing to the thickneſs of the Scion Tooth, and in the upper jaw, ſome part may be filed off the hollow or concave ſurface of the Tooth, where the oppoſite touch. When it is owing to the poſition of the Teeth, the ſame thing may be done with propriety. By attending to this circumſtance in the tying, this inconvenience may in many caſes be prevented; however, if it ſhould not be in the power of the dentiſt to prevent it by the above mentioned method, then he ſhould bring them forwards by tying them to a ſilver plate, a little more bent than the circle of the Teeth,

and

and reſting at each end upon the neighbouring Teeth.

Where a Tooth does not exactly fit, but is too ſhort, then there ariſes a difficulty with the patient whether he ought to conſult propriety or beauty. The Tooth ſhould be as much in the Socket as it can be with eaſe; for, although in that caſe it is too ſhort, appearances muſt give way.

The patient muſt now finiſh the reſt. He muſt be particularly attentive at firſt, and give it as little motion as poſſible. In many caſes a ſoreneſs will continue ſome days, and the gums will ſwell; in others there will neither be ſoreneſs nor ſwelling.

The patient muſt take great care not to catch cold, or expoſe himſelf to any of the other common cauſes of fever; for ſuch accidents are very likely to prevent the ſucceſs of this operation. This caution is more neceſſary in the winter, than the ſummer.

The Tooth in ſome will begin to be faſt in a few days, and the gum will cling cloſe to it; while, in others, many weeks will paſs before this happens; though the Tooth may become fixed at laſt.

I have

I have ſeen the tranſplanted Tooth come a little way out of the Socket; and, without any art being uſed, retire into it as far as at firſt. The ſilk is to be removed ſooner or later, according as the Tooth is more or leſs faſt; in ſome people after a fortnight, in others not till ſome months after the operation.

This operation, like all others, is not attended with certain ſucceſs. It ſometimes happens that the two parts do not unite; and in ſuch caſes the Tooth often acts as an extraneous body *, and inſtead of faſtening, the Tooth becomes looſer and looſer: the gum ſwells, and a conſiderable inflammation is kept up, often terminating in a Gum-Boil. In ſome caſes, where it is alſo not attended with ſucceſs, there are not theſe ſymptoms: the parts appear pretty ſound, only the Teeth do not faſten, and ſometimes drop out.

* I ſay often, becauſe I do not ſuppoſe that it always acts as an extraneous body; becauſe we know that dead Teeth have ſtood for years, without affecting the Sockets or Gums in the leaſt. We may therefore ſuppoſe, that it is ſometimes the caſe with tranſplanted living Teeth.

It alſo happens, that tranſplanted Teeth have a very ſingular operation performed on them while in the Socket; the living Socket and Gum finding this body kept in by force, ſo that they cannot puſh it out, ſet about another mode of getting rid of it, by eating away the fang till the whole is deſtroyed, exactly ſimilar to the waſting of the fangs of the temporary Teeth in the young ſubject*.

I have all along ſuppoſed, that where this practice is attended with ſucceſs, there is a living union between the Tooth and Socket, and that they receive their future nouriſhment from this new maſter. My reaſons for ſuppoſing it were founded on experiments on other parts †, in animals, and alſo obſervations made on the practice itſelf: for firſt I obſerved that they kept their colour, which is very different from that of a dead Tooth; for a living Tooth has a degree of tranſparency, while a dead one is of an opaque chalky white.

Secondly, there are inſtances of their becoming diſeaſed, in the ſame manner as an original living

* Vide Natural Hiſtory, page 98, plate X. fig. 2.

† Vide Natural Hiſtory, page 126.

Tooth;

Tooth; at leaſt the following caſe favours ſtrongly this opinion.

In *October*, 1772, a gentleman, of the city of *London*, had a Tooth tranſplanted, which was perfectly ſound, and fixed in its new Socket extremely well; about a year and a half after, two ſpots were obſerved on the fore part of the body of the Tooth, which threatened a decay; they were exactly ſimilar to ſpecks, or the firſt appearance of decay, which come upon natural living Teeth. Pain is alſo ſometimes felt in the tranſplanted Tooth.

But what puts it beyond a doubt is, that a living Tooth, when tranſplanted into ſome living part of an animal, will retain its life; and the veſſels of the animal ſhall communicate with the Tooth; as is ſhewn by the following experiments.

I took a ſound Tooth from a perſon's head; then made a pretty deep wound with a lancet into the thick part of a cock's comb; and preſſed the fang of the Tooth into this wound, and faſtened it with threads paſſed through

other parts of the comb. The cock was killed ſome months after; and I injected the head with a very minute injection: the comb was then taken off, and put into a weak acid, and the Tooth being ſoftened by this means, I ſlit the comb and tooth into two halves, in the long direction of the Tooth. I found the veſſels of the Tooth well injected, and alſo obſerved that the external ſurface of the Tooth adhered every where to the comb by veſſels, ſimilar to the union of a Tooth with the Gum and Sockets*.

* I may here juſt remark, that this experiment is not generally attended with ſucceſs. I ſucceeded but once out of a great number of trials.

Of

OF

DENTITION.

TEETH, at their firſt formation, and for ſome time while growing, are completely incloſed within the Sockets and Gums *, and in their growth they act upon the incloſing parts in ſome degree as extraneous bodies; for while the operation of growth is going on in them, another operation is produced, which is a decay of that part of the Gum and Socket that covers the Tooth, and which becomes the cauſe of the very diſagreeable and even dangerous ſymptoms which attend this proceſs. As the Teeth advance in ſize, they are in the ſame proportion preſſing againſt theſe Sockets or Gums, from whence inflammation and ulceration are produced.

* Vide Natural Hiſtory, page 77 and 78, plate XII. fig. 3.

That

That ulceration which takes place in Dentition, is one of the ſpecies which ſeldom or never produces ſuppuration: However in ſome few caſes I have found the Gums ulcerated, and the body of the Tooth ſurrounded with matter; but I believe this ſeldom happens till the Tooth is near cutting the ſkin of the Gums.

As this is a diſeaſe of an early age, and indeed almoſt begins with life, its ſymptoms are more diffuſed, more general, and more uncertain at ſuch an early period, than thoſe of any diſorder of full grown people, putting on the appearance of a great variety of maladies; but theſe ſymptoms become leſs various, and leſs hazardous, as the child advances in years; ſo that the double Teeth of the child, and ſtill more ſo the ſecond ſet of Teeth, or thoſe of the adult, are uſually cut without producing much diſturbance.

Theſe ſymptoms are ſo various in different children, and often in the ſame child, that it is difficult to conceive them to be from the ſame origin; and the varieties are ſuch as ſeem to be beyond our knowledge.

They

They produce both local and conſtitutional complaints, with local ſympathy.

The local ſymptoms we may ſuppoſe to be attended with pain, which appears to be expreſſed by the child when he is reſtleſs, uneaſy, rubs his gums, and puts every thing into his mouth. There is generally inflammation, heat, and ſwelling of the Gums, and an encreaſed flow of ſaliva.

The conſtitutional, or general conſequential ſymptoms, are fever, and univerſal convulſion. The fever is ſometimes ſlight, and ſometimes violent. It is very remarkable both for its ſudden riſe and declenſion; ſo that in the firſt hour of this illneſs the child ſhall be perfectly cool, and in the ſecond fluſhed and burning hot, and in the third temperate again.

The partial or local conſequential ſymptoms are the moſt various and complicated; for the appearance they put on is in ſome degree determined by the nature of the parts they affect; wherefore they imitate various diſeaſes of the human body. Theſe ſymptoms we

ſhall

ſhall deſcribe in the order of their moſt frequent occurrence.

Diarrhœa, coſtiveneſs, loſs of appetite, eruptions on the ſkin, eſpecially on the face and ſcalp, cough, ſhortneſs of breath, with a kind of convulſed reſpiration, ſimilar to that obſervable in the hooping cough, ſpaſms of particular parts, either by intervals or continued, an increaſed ſecretion of urine, and ſometimes a diminution of that ſecretion, a diſcharge of matter from the *penis*, with difficulty and pain in making water, imitating exactly a violent *gonorrhœa*.

The lymphatic glands of the neck are at this time apt to ſwell; and if the child has a ſtrong tendency to the ſcrofula, this irritation will promote that diſeaſe.

There may be many other ſymptoms with which we are not at all acquainted, the patients in general not being able to expreſs their feelings. Many of the ſymptoms of this diſeaſe are dangerous, namely, the conſtitutional ones, and alſo thoſe local ſymptoms which attack a vital part. The fever, indeed, ſeldom laſts ſo long as to be fatal; but the convulſions, eſpecially when

when univerſal, frequently are ſo. Local convulſions, if not in a vital part, although often very violent, do not kill; and when any part not vital ſympathizes, the patient is generally free from danger; a ſecurity to the whole being obtained by the ſufferings of a part which is of little conſequence to life.

Univerſal ſympathy ſeems to be the firſt effect of irritation, and in general appears as ſuch in thoſe whoſe local and partial ſenſation, and irritability, are not yet formed; for, in ſuch ſubjects, when one part is irritated, the whole ſympathizes, and general convulſions enſue. But as the ſenſations and partial irritability begin to be formed, each part, in ſome degree acting for itſelf, acquires its own peculiarities; ſo that when a local diſeaſe takes place in a patient that is very young, it is capable of giving a general diſpoſition to ſympathize; but as the child advances, the power of ſympathy becomes partial, there not being now in the conſtitution that univerſal conſent of parts; but ſome one part is found which has a greater aptitude than the reſt to fall in with the local irritation; therefore the whole diſpoſition for ſympathy is directed to ſome particular part, and it ſympathizes according to its own peculiar ac-

tion. This ariſes from the different organs acquiring more and more their own independent ſenſations as the child grows older; and gradually loſing the power of ſympathiſing with one another: ſo that by the age of ſix years few parts ſuffer but thoſe immediately affected; and in adults, who cut their Teeth, we almoſt always find the pain and other ſymptoms confined to the part, or only local ſympathy taking place, ſuch as a ſwelling of the ſide of the face.

But as the ſymptoms become more confined, the ſuffering part is often much more violently affected, than where it has a power of taking in the other parts. Therefore we find that in adults the pain of cutting a grinder is frequently exceſſive, and that the local inflammation is very conſiderable, and often of long continuance *. This is not the caſe with children; their pain does not appear to be ſo very conſiderable, and we are certain that the local inflammation is not great; that it is confined to the very parts which ſuffer, and is not diffuſed over the face; ſo that in children the ſymptoms of ſympathy are often more violent than

* Vide Caſe the third.

thoſe

thoſe of the parts themſelves. Though it is generally a fact, that the ſymptoms of Dentition in adults are confined to the parts immediately injured, it is not always or certainly ſo; for ſometimes, as will appear from caſe the fourth, there will be the ſtrongeſt ſymptoms imaginable from ſympathy; which ſeems to be owing to a peculiar aptitude in the conſtitution to univerſal ſympathy. Theſe pains in the adult are often periodical, having their regular and fixed periods, from which circumſtance they are often ſuppoſed to be aguiſh, and the bark is adminiſtered, but without effect. Medicines for the rheumatiſm are likewiſe given, with as little ſucceſs; when a Tooth will appear, and diſcloſe the cauſe of the complaint; and by lancing the gums the cure often is performed, but the diſeaſe will recur if the gum happens to heal over the Tooth, which it will very readily do, if the Tooth is pretty deep. As theſe Teeth are generally ſlower in their growth than the others, and more eſpecially thoſe which come very late, they become the cauſe of many returns of the ſymptoms. How far children under this circumſtance are ſubject to paroxyſms of the diſeaſe, is not an eaſy thing to determine; but from many of their ſympathetic

ſymptoms going off and returning, it would appear that they have alſo their exacerbation.

Of the CURE.

THE cure of diſeaſes ariſing from Dentition, from their nature, can only be temporary and local, even when it is directed to the real ſeat of the diſeaſe; and certainly every method of cure which is not ſo directed, muſt prove ineffectual, as it can only operate by deſtroying the effect. Opiates, indeed, will in ſome degree take off the irritation, by deſtroying the ſenſibility of the part; but ſurely it would be better at once to remove the cauſe, than to be attempting from time to time to remove or palliate the effect. When the ſympathy is partial, and not in a vital part, it would be better to allow it to continue than cure it, becauſe it may by ſuch means become univerſal: for inſtance, if it is a diarrhœa, the beſt way is to allow it to go on, or at leaſt only correct it if too violent, which is often the caſe. I have ſeen caſes, where the ſtomach and inteſtines have ſympathized ſo much, as almoſt to threaten death.

death. The ſmall quantity of nouriſhment that the ſtomach could admit of, was hurried off by the inteſtines.

Of cutting the GUMS.

AS far as my experience has taught me, to cut the gum down to the Teeth appears to be the only method of cure. It acts either by taking off the tenſion upon the gum, ariſing from the growth of the Tooth, or by preventing the ulceration which muſt otherwiſe take place.

It often happens, particularly when the operation is performed early in the diſeaſe, that the gum will reunite over the Teeth; in which caſe the ſame ſymptoms will be produced, and they muſt be removed by the ſame method.

I have performed the operation above ten times upon the ſame Teeth, where the diſeaſe had recurred ſo often, and every time with the abſolute removal of the ſymptoms.

It has been aſſerted, that to cut the gum once will be ſufficient, not only to remove the preſent, but to prevent any future bad ſymptoms from the ſame cauſe. This is contradictory to experiment, and the known laws of the animal œconomy; for frequently the gum, from its thickneſs over the Tooth, or other cauſes, muſt neceſſarily heal up again, and the relapſe is as unavoidable as the original diſeaſe.

A vulgar prejudice prevails againſt this practice, from an objection, that if the gum is lanced ſo early, as to admit of a re-union, the cicatriſed part will be harder than the original gum, and therefore the Teeth will find more difficulty in paſſing, and give more pain. But this is alſo contrary to facts; for we find that all parts which have been the ſeat either of wounds or ſores, are always more ready to give way to preſſure, or any other diſeaſe which attacks either the part itſelf or the conſtitution. Therefore each operation tends to make the paſſing of the Teeth eaſier.

When the Teeth begin to give pain, we find them generally ſo far formed, as to be eaſily diſcerned through the gum.

The

The fore Teeth are to be obſerved at firſt, not on the edge of the gum, but on the fore part, making riſings there, which appear whiter than the other parts: and it may be obſerved, that the gums are broader than uſual. At this period the inciſions muſt be made pretty deep, till the Tooth be felt with the inſtrument, otherwiſe little effect will be produced by the operation: and this is the general rule with reſpect to the depth of the inciſion in all caſes.

When the grinders ſhoot into the gum, they flatten the edge of the gum, and make it broad. Theſe Teeth are more eaſily hit by the inſtrument than the fore Teeth.

The operation ſhould not be done with a fine pointed inſtrument, ſuch as a common lancet, becauſe moſt probably the point will be broken off againſt the Tooth, which will make the inſtrument unfit for going on further, if more inciſions are required.

A common lancet, with its point rounded, is a very good inſtrument; but an inſtrument, ſomething like

like a fleam, would be of the moſt convenient ſhape.

There is no need of any great delicacy in the operation, the gums being very inſenſible parts; and to cut through the whole gum down to the Teeth with certainty, when they are pretty deep, requires ſome force.

The gums will bleed a little, which may be of ſervice in taking off the inflammation. I never ſaw a caſe, where the bleeding either proved inconvenient or dangerous. If it ever ſhould be troubleſome, I think there could be no great difficulty in ſtopping it. In general, no application is neceſſary: the gums ſoon unite at the moſt diſtant part from the Tooth, if it lies deep; and if it be more ſuperficial, the thin gum ſoon ſhrinks back over the Tooth, leaving it bare, and decays.

This cutting of the *dentes ſapientiæ* is often attended with an inconvenience, which does not attend the others; and this happens, I believe, only when they come

come very late, *viz.* when the jaws have left off growing. This is the want of room in the jaws for theſe late Teeth; a circumſtance which produces an addition to the other inconveniencies ariſing from Dentition. When it takes place in the upper jaw, the Tooth is often obliged to grow backwards; and in ſuch a poſition it ſometimes preſſes on the interior edge of the coronoide proceſs, in ſhutting the mouth, and gives great pain. When it takes place in the lower jaw, ſome part of the Tooth continues to lie hid under that proceſs, and covered by the ſoft parts, which are always liable to be ſqueezed between that Tooth and the correſponding Tooth in the upper jaw. To open very freely, is abſolutely neceſſary in theſe caſes: but even that is often not ſufficient. Nothing but drawing the Tooth, or Teeth, will remove the evil in many caſes.

CASES.

It would be endleſs to give hiſtories of caſes, exemplifying each ſymptom of Dentition. I ſhall only relate a few which are ſingular; and which, being

extraordinary, will the better enforce the propriety, in all caſes, of the cure I have recommended.

CASE I.—A young child was attacked with contractions of the *muſculi flexores* of the fingers, and alſo of the toes. Theſe contractions were ſo conſiderable as to keep her fingers and thumb conſtantly clinched, and ſo irregularly, that they appeared diſtorted. All the common antiſpaſmodic medicines were given, and continued for ſeveral months, but without ſucceſs.

I ſcarified the gums down to the Teeth, and in leſs than half an hour all the contractions had ceaſed. This, however, only gave relief for a time. The gums healed; the Teeth continued to grow, and filled up the new ſpace acquired by the ſcarifications; and the ſame ſymptoms appeared a ſecond time.

The former operation was immediately performed; and with the ſame ſucceſs.

CASE II.—A boy, about two years of age, was taken with a pain and difficulty in making water; and voided matter from the *urethra*. I ſuſpected that by

ſome

ſome means or other this child might poſſibly be affected by the venereal poiſon; and the ſuſpicion naturally fell on the nurſe.

Theſe complaints ſometimes abated, and would go off altogether; and then return again. It was obſerved at laſt, that they returned only upon his cutting a new Tooth: this happened ſo often, regularly and conſtantly, that there was no reaſon to doubt but that it was owing to that cauſe.

Case III.—A lady, about the age of five or ſix and twenty years, was attacked with a violent pain in the upper jaw; which at laſt extended through the whole ſide of the face, ſimilar to a violent Tooth-ach, from a cold; and was attended with conſequent fever.

It was treated at firſt as a cold; but, from its continuance, was afterwards ſuppoſed to be nervous.

The caſe was repreſented to me from the country; and I gave the beſt directions, that I could, on a repreſentation of the ſymptoms.

She came to London ſome months after, ſtill labouring under the ſame complaint. Upon examining the mouth, I obſerved one of the points of the *dens ſapientiæ* ready to come through. I lanced the gums, and the diſorder gave way immediately.

A lady, about the ſame age, was attacked with a violent pain in the left ſide of her face. It was regularly periodical; coming on at ſix o'clock in the evening. She took the Peruvian bark, which had no effect. She took antimonials, and Dovar's powder, which alſo were equally ineffectual. But one of the points of the *dens ſapientiæ* of the upper jaw, of the ſame ſide, appearing, ſhewed the cauſe, and indicated the remedy. The gums were lanced; and the pain ceaſed.

INDEX.

INDEX.

N. B. THE Roman Numerals I. and II. diſtinguiſh the Two Parts of the Work: the Figures refer to the Pages of each, reſpectively.

A.

ABCESSES of the antrum maxillare, ſymptoms and cauſes of, II. 44. Treatment of, 45.

——————— in the jaws, when deeply ſeated, how to be treated, II. 41. See *Gum boils.*

Adult teeth, progreſs of their formation, I. 82. The firſt grinder decaying at an early age ought to be removed, II. 81.

Air, coming in contact with the nerve of a tooth, the cauſe of pain in, I. 121. Means for excluding it, 122.

Alveolar proceſs, in the upper jaw, deſcribed, I. 2. In the lower jaw, 3. Of the upper and lower jaw compared, 4. The ſockets for the teeth, how formed, 6. In both jaws are rather to be conſidered as belonging to the teeth, than as parts of the jaw, 7. The formation of, traced from infancy to adult age, 74. Decay of, by waſting, II. 47. A filling up of the ſocket, and protruſion of the tooth, 48. The cauſe of theſe two diſorders inquired into, 49. Effects of the ſcurvy on, 51. Decay of, by what is called the ſcurvy of the gums, 57.

Animal ſubſtances, inſtances ſhewing their diſpoſition to unite, I. 127.

Antrum maxillare, ſymptoms and cauſes of abceſſes in, II. 44. Treatment of, 45.

Articulation of the lower jaw deſcribed, I. 9. Of the teeth, 65.

Aſtringents, their uſe in hardening the gums, II. 53. See *Gums.*

INDEX.

B.

Bicuſpides, particular deſcription of that claſs of teeth, I. 55. Their uſe, 57.
Breath, rendered foul, by rotten teeth, II. 14. See *Scurvy*.
Burning the nerve of a tooth, method of performing, II. 17. Of the ear, ſometimes ſucceſsful in the tooth ach, 18.

C.

Calculi, human, how formed, I. 96, 125.
Cartilage, moveable, in the articulation of the jaws, deſcribed, I. 10. Principal uſe of, 13.
Cauſtics, how to apply, to the nerve of a tooth, II. 17.
Cells for the teeth, how formed, I. 75. See *Alveolar proceſſes*.
Chin, how projected forward in aged perſons, I. 73.
Circulation of the animal fluids, the uſual conſequences of its interruption, I. 125.
Cleaning of the teeth, various methods of, II. 69. Tendency of vegetable food to the ſame purpoſe, 70.
Coronoide proceſs in the under jaw, deſcribed, I. 4. The cells for the grinders formed in the root of, 75.
Cuſpidati, or canine teeth, particular deſcription of, I. 52. Their uſe, 54. The frequent irregularity of, to what owing, II. 73.

D.

Dead teeth, in what caſes they are preferable to living ones, for tranſplantation, II. 96. The objections they are liable to, 105.
Dentes ſapientiæ, particular deſcription of thoſe teeth, I. 60. A frequent inconvenience in the cutting of, II. 124. Violent pain from the cutting of, 127.
Dentition, cauſe of the pain in, explained, I. 80. II. 113. Symptoms of, 114. Origin of theſe ſymptoms accounted for, 117. Methods of relief and cure, 120. Lancing the gums, 121. Contractions of the fingers and toes produced by, 126.
Denudation, the decay of teeth by, deſcribed, II. 24. See *Scurvy*.
Digaſtricus, deſcription and uſe of this muſcle, I. 25.
Diſeaſes of the teeth ſpecified, I. 121.

Drawing

Drawing of teeth, the proper indications for, II. 87. Conſequence of deferring the operation too long, 89. Directions for the performance, *ibid.* Remarks on the uſual treatment of the gums, 90. How to ſtop the extraordinary bleeding of the gums, 92. No bad conſequences to be apprehended from breaking the alveolar proceſſes, *ibid.* Breaking of teeth, 93. How to replace a tooth drawn by miſtake, 103.

E.

Ear, burning of, ſometimes ſucceſsful in the tooth ach, II. 18.
Enamel of the teeth, deſcription and uſe of, I. 33. Experiments on, to aſcertain the nature of its compoſition, 34. Formation of, explained, 94.

F.

Face, how ſhortened in aged perſons, I. 73.
Fangs of teeth, comparative obſervations on, I. 62. How formed, 90. Will continue ſound when the tooth is deſtroyed, II. 4. Swelling of, deſcribed, 27.
Fingers and toes, caſe where a contraction of, was produced by dentition, II. 126.
Fluids, animal, the conſequences of their ſtagnation pointed out, I. 125.
Fœtus, progreſs of the formation of the teeth in, explained, I. 77.

G.

Grinders, particularly deſcribed, I. 58. Difference between thoſe on the upper, and thoſe on the under jaw, 60. The removal of the firſt, when decaying at an early age, recommended, II. 81.
Gums, the nature and uſe of, explained, I. 66. How affected by dentition, 80. Excreſcences from, how to be treated, II. 39. Effect of the ſcurvy on, 51. Treatment of in this caſe, *ibid.* Symptoms of the diſorder vulgarly called the ſcurvy of, 55. The cauſe of inveſtigated, 56. Proper treatment of in this caſe, 57. Callous thickenings of, 59. When of a cancerous nature, require chirurgical treatment, 60. Remarks on the common treatment of, in drawing teeth, 90. Method of checking the extraordinary bleeding of, when a tooth is drawn, 92. An attentive examination into the

the ſtate of, neceſſary, when teeth are to be tranſplanted, 95. When they ought to be cut to facilitate dentition, 121, 127, 128.

Gum boils, the cauſes of, explained, II. 29. Extraction of the affected tooth, the only cure of, in the laſt reſort, 35. How to open and dreſs them, 36. Treatment of in the back part of the mouth, 37. See *Abceſſes* and *Scurvy*.

H.

Hemlock, ſucceſsfully uſed in nervous pains in the jaws, II. 63.

Hollow teeth, methods of ſtopping, II. 20.

I.

Jaw, the upper, its form, and the bones of which it is compoſed, I. 1. Lower, deſcribed, 3. The articulation of the lower, explained, 9. The ſeveral motions of which it is capable, 12. The muſcles ſubſervient to theſe motions, 15. Critical remarks on theſe motions, 29. The full uſual number of teeth on each, 46. Difference between the grinders in the upper, and thoſe in the lower, 60. The motion of, in young and old perſons compared, 72. The growth of, explained, 101. Abceſſes in, how to be treated, II. 41. Cautions relative to nervous pains in, 61. Irregularities between, and the teeth, 82. Method of rectifying the projection of the lower one, 84. See *Alveolar proceſſes*.

Inciſores, the claſs of teeth ſo called, particularly deſcribed, I. 49.

Incruſtations on the teeth, the nature of, explained, II. 64. Mechanical methods of removing, 69. Chemical applications, 70. See *Scaling*.

Inflammation of the teeth, ſymptoms of, II. 10. Treatment of, 18.

L.

Lancet, the proper form of, for cutting the gums to promote dentition, II. 123.

M.

Madder, the effects of, on the teeth of a young pig, I. 37. See *Offification.*
Man, whether to be ranked in the claſs of carnivorous animals, from his teeth, I. 119.
Maſſeter muſcle, its deſcription and uſes, I. 16.
Maſtication, the ſeveral motions of the under jaw in, I. 13. Action of the teeth in, 68.
Mercury, the taking of, deſtructive to the tranſplantation of teeth, II. 97.
Milk teeth, progreſs of the formation of, in the foetus, I. 77. See *Dentition.*
Molares, origin of the formation of, in the foetus, I. 78.
Mortification of the teeth, ſymptoms of, II. 3. Inquiry into the cauſe of, 8. Prevention and cure of, 15.

N.

Nerve of a tooth, if expoſed to the air, the ſeat of the tooth ach, I. 114, 121. Method of ſheltering it from the air, 122. Method of burning it, II. 17.

O.

Offification, the general progreſs of, different from the formation of teeth, I. 39. Of a tooth upon the pulp, explained, 88. See *Dentition.*

P.

Perioſteum of the teeth deſcribed, I. 43.
Poſterior proceſs in the under jaw, deſcribed, I. 4.
Proceſſes; ſee *Alveolar*, *Coronoide*, and *Poſterior.*
Projection of the under jaw, method of rectifying, II. 84.
Pterygoidæus internus, its deſcription and uſe, I. 22. The *pterygoidæus externus*, 23.

INDEX.

R.

Rabbit mouth, means of rectifying, II. 79.
Replacing of a tooth drawn by miſtake, inſtructions for, II. 103.
Rickets, the growth of teeth not affected by that diſorder, I. 40.
Roof of the mouth, oſteological deſcription of, I. 2.
Rotting of the teeth, ſymptoms and conſequences of, II. 1. Inquiry into the cauſe of, 8. Whether a rotten tooth has any contaminating power, 9. Symptoms of inflammation, 10. Is cured only by extraction, 14. The breath rendered foul by, *ibid.* Prevention and cure of, 15.

S.

Scaling of teeth, the utility of this operation, I. 124. Caution in, II. 69.
Scion teeth, inſtructions for the choice of, II. 99.
Scurvy, effects of that diſorder on the gums and alveolar proceſſes, II. 51. Is the firſt object of cure, 53. Of the gums, 55.
Senſibility of the teeth accounted for, I. 114.
Shedding of teeth, the proceſs of, explained, I. 98. The neceſſity of a new ſet pointed out, 105.
Stopping of hollow teeth, method of performing, II. 20.
Stumps of teeth, the ſtate in which they uſually remain, II. 5.
Supernumerary teeth, the origin of, accounted for, I. 115. Ought to be removed, II. 83.
Sympathy, the cauſe of the diſorders incident to dentition, II. 117. The ſymptoms of in children, often more violent than in the parts immediately affected, 118. How adults are affected by it, 119. To be cured by local application, 120.

T.

Teeth, the ſockets for, how formed, I. 6. The alveolar proceſſes belong rather to them, than to the jaws, 7. Deſcription and uſe of the enamel, 33. The interior ſubſtance of, 36. Whether vaſcular or not, 37. The growth of, different from that of bones, 39. The growth of, not affected by the rickets, 40. The cavity in, 41.

The

The perioſteum of, 43. The natural ſituation of, 44. The full number of, 46. The ſeveral claſſes of, 47. The inciſores, 49. The cuſpidati, 52. The bicuſpides, 55. The grinders, 58. Their fangs, 62. Articulation of, 65. Action of, from the motion of the lower jaw, 68. The cells for, how formed, 75. Formation of, in the foetus, 77. Cauſe of the pain in dentition, explained, 80. Adult, progreſs of their formation, 82. A third ſet, ſometimes formed in old age, 84. Manner of formation, 86. Proceſs of ſhedding, deſcribed, 98. Reaſon of the ſhedding of, 105. How the cavity fills up with new matter as they wear down, 108. Whether they continued to grow after being completely formed, 110. The ſenſibility of, accounted for, 114. Supernumerary, how they originate, 115. How they affect the voice, 117. Whether man is proved to be a carnivorous animal by his teeth, 119. The diſeaſes they are ſubject to, 121. Of cleaning them, 124. Tranſplantation of, 126. Decay of, by rotting, II. 1. Inquiry into the cauſe of their rotting, 8. Whether a rotten tooth has any contaminating power, 9. Symptoms of inflammation, 10. The pain of, brought on by circumſtances unconnected with the diſeaſe, 13. Prevention and cure of rottenneſs in, 15. Methods of burning the nerve, 17. Methods of ſtopping them where hollow, 20. Decay of, by denudation, 24. Swelling of the fangs deſcribed, 27. The nature and cauſes of gum boils, 29. Treatment of, 35. Incruſtation of extraneous matter upon, 64. Mechanical methods of removing, 69. Chemical applications to, 70. Irregularity in the poſition of, to what owing, 72. The operation of moving them deſcribed, 77. Cautions as to the extraction of thoſe that are irregular, 78. Method of rectifying what is called the rabbit mouth, 79. The proper indications for drawing them, 87. Conſequence of deferring the operation too long, 89. Directions for the performance, *ibid.* Inſtructions for the tranſplantation of, 94.

Temporal muſcle, its deſcription and uſes, I. 19.

Tooth ach, is cauſed by the expoſure of the nerve of the tooth to the air, I. 114, 121. How to ſtop a hollow tooth, 122. Method of burning the nerve, II. 17. Other modes of treatment, 18. Cautions in relation to nervous pains in the jaws, 61. Inſtructions for the drawing of teeth, 87.

Tranſplantation of teeth, facility of this operation, I. 126. Succeſsful performance of, II. 50. General remarks on, 94. Neceſſary attentions to the ſtate of the gums and ſockets, 95. In what caſes dead

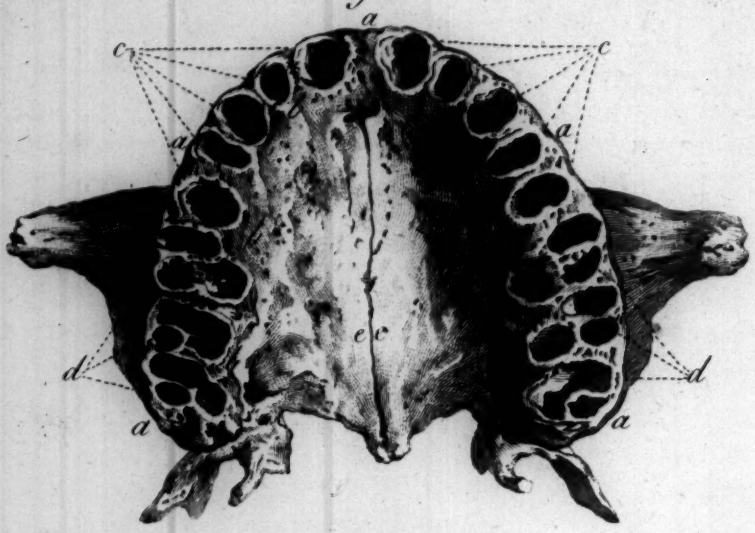
teeth are preferable to living ones, 96. In what cases it ought not to be attempted, 97. Ought not to be attempted on persons while taking of mercury, *ibid.* The proper age for the performance of, 98. Directions for the choice of scion teeth, 99. Of replacing a sound tooth when drawn by mistake, 103. Successful instance of replaced teeth, 104. Of dead teeth, 105. How teeth are to be fixed and tied, 106. How the patient is to conduct himself, 108. Accidents to which transplanted teeth are liable, 109. Evidences of a living union between transplanted teeth and their sockets, 110.

V.

Vegetable food, its disposition to keeping the teeth clean, II. 70.
Voice, how affected by the teeth, I. 117.
Urethra, case where a disorder of, was produced by dentition, II. 126.

THE END.

Fig. 1.



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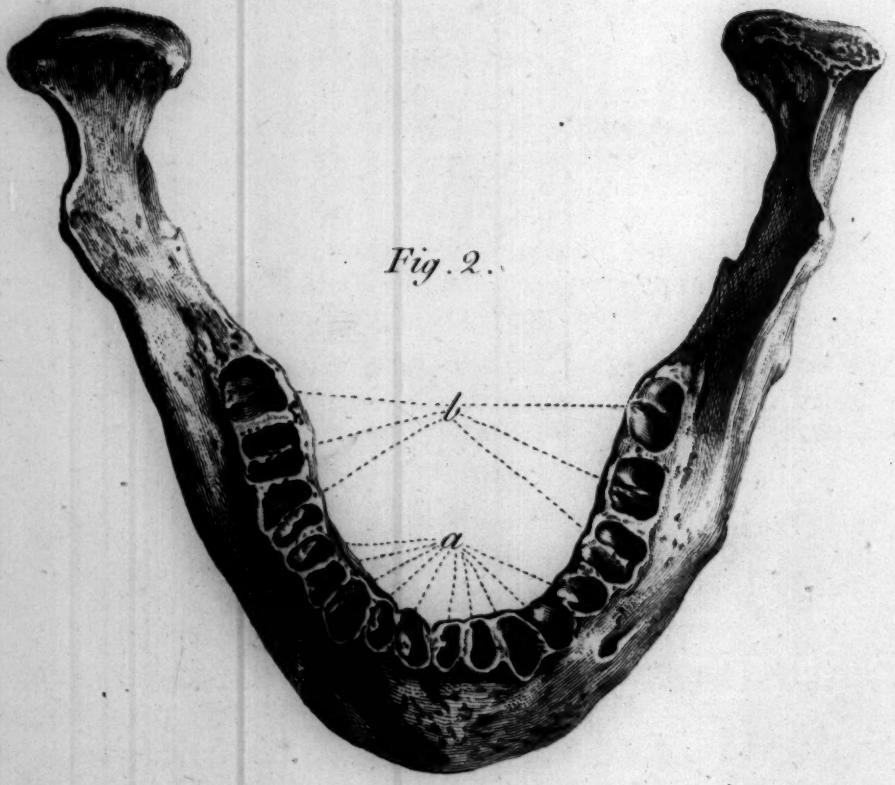

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EXPLANATION

OF THE

PLATES.

PLATE I.

FIG. I.

A Repreſentation of the under-ſide of the Upper-Jaw, without the Teeth

a a a a a The outer line of the circle, or what is commonly called the outer plate of the Alveolar proceſs.

b b b The inner line of the circle, commonly called the inner plate.

c c The 10 ſingle Sockets, viz: for the Inciſores, Cuſpidati, and Bicuſpides.

d d The 3 double Sockets for the Molary, or triple-fanged Teeth. The two firſt have three ſockets, and the laſt only two.

Fig II. A repreſentation of the upper part of the Lower-Jaw, ſhewing particularly the Sockets of the Teeth.

a The Sockets of the ten ſingle-fanged Teeth.

b The Sockets of the 3 double-fanged Teeth.

PLATE. II.

A Sketch of the Head to explain what was ſaid of the motions of the Lower-Jaw.

A The Section of the Head which was made to bring the Articulation of the Lower-Jaw into view.

B Lower-Jaw.

C The condyle of the Lower-Jaw.

D The occipital condyle of the Head.

E F The Digaſtric Muſcle.

E Its origin.

F Its inſertion.

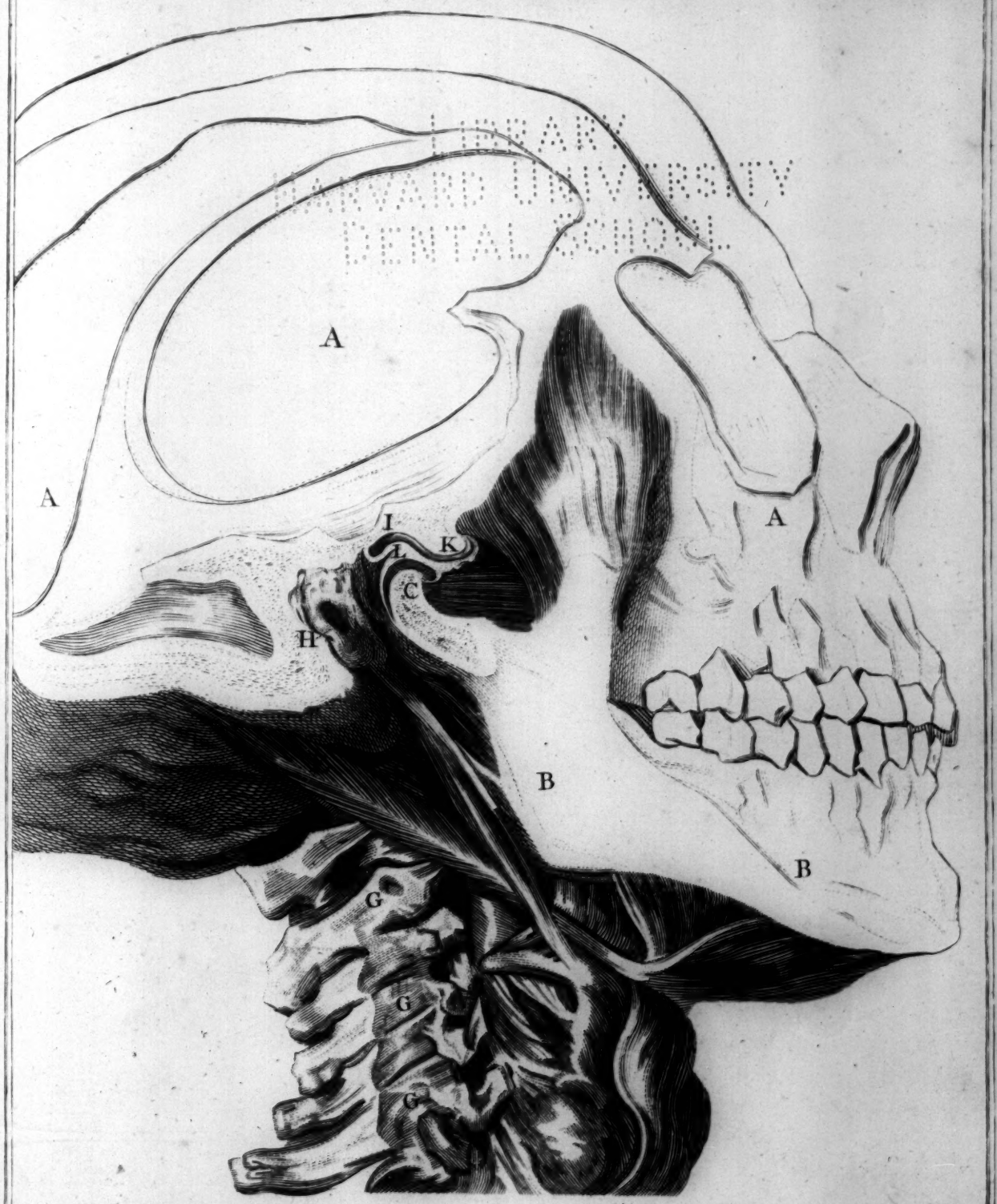
G G G The *Vertebræ* of the Neck.

H The *Meatus Auditorius externus.*

I The hollow, or cavity in the temporal bone for the articulation of the Lower-Jaw.

K The eminence before that cavity, likewiſe for articulation.

L The moveable cartilage of the Joint.



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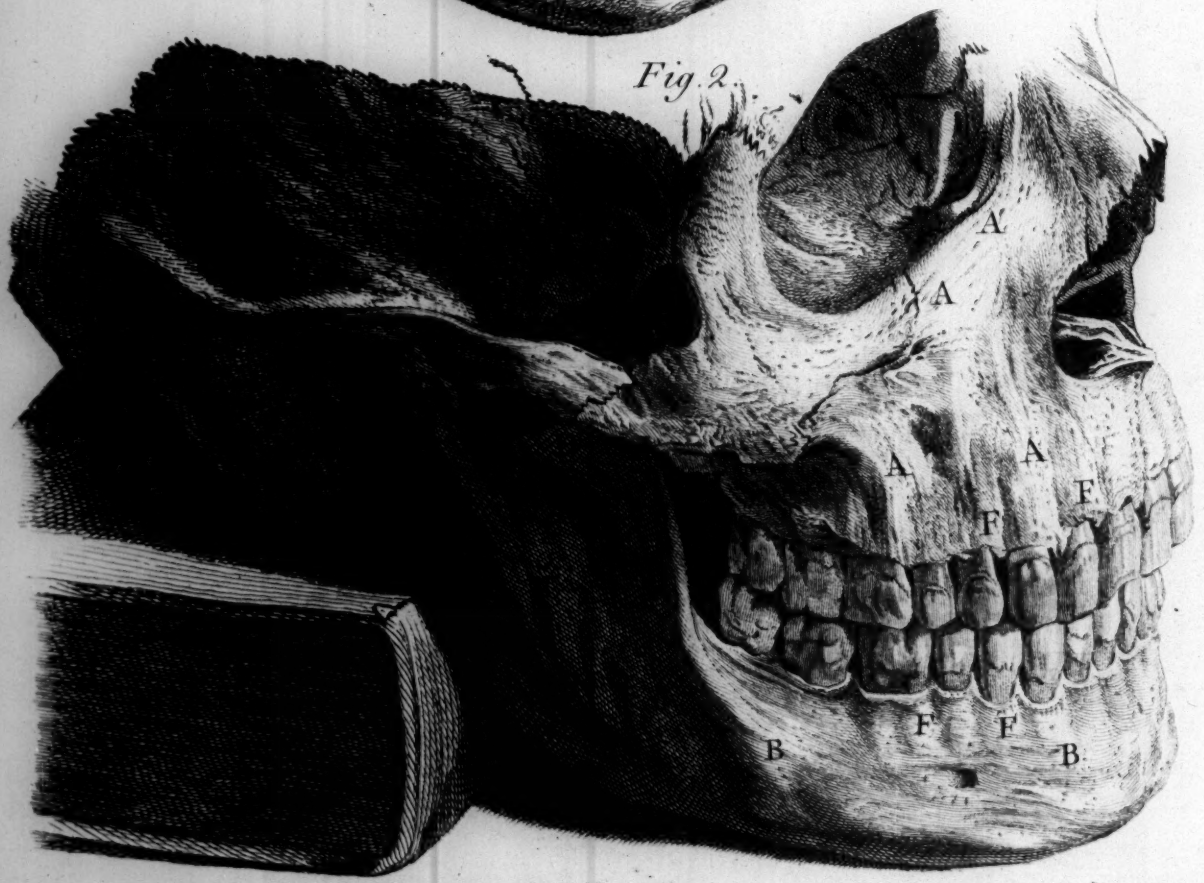

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PLATE III.

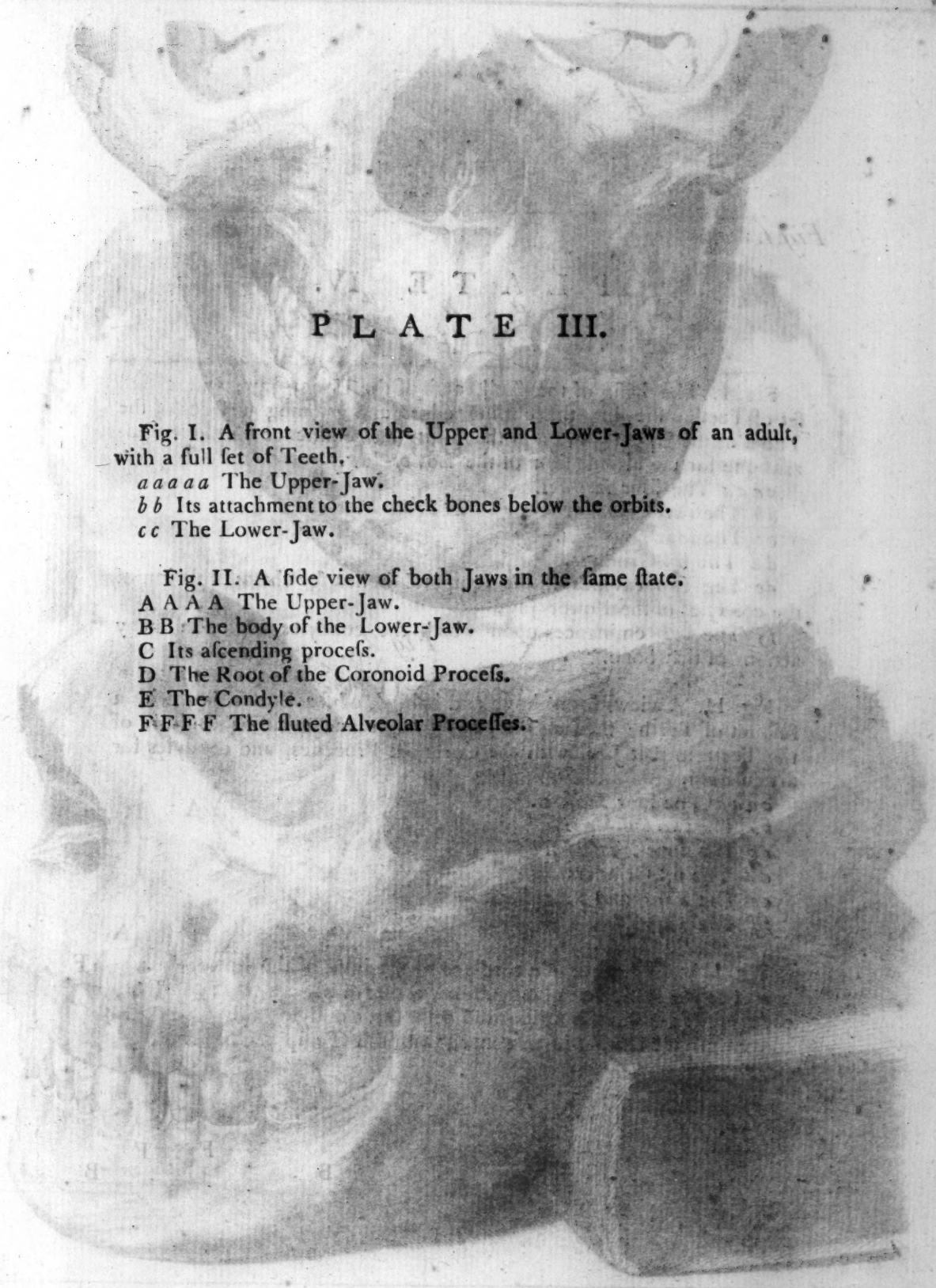


Fig. I. A front view of the Upper and Lower-Jaws of an adult, with a full ſet of Teeth.

a a a a a The Upper-Jaw.
b b Its attachment to the check bones below the orbits.
c c The Lower-Jaw.

Fig. II. A ſide view of both Jaws in the ſame ſtate.

A A A A The Upper-Jaw.
B B The body of the Lower-Jaw.
C Its aſcending proceſs.
D The Root of the Coronoid Proceſs.
E The Condyle.
F F F F The fluted Alveolar Proceſſes.

PLATE IV.

Fig. I. The baſis of the ſkull, and of the Upper-Jaw, with a full ſet of Teeth; ſhewing the cutting edges and grinding ſurfaces of the Teeth of the Upper-Jaw, and the cavity and eminence of the temporal bone for the articulation of the Lower-Jaw.

a a a a The four *Inciſores.*

b b The two *Cuſpidati.*

c c The four *Bicuſpides.*

d d The ſix Grinders.

e e The two cavities in the temporal bones for the articulation of the condyles of the Lower-Jaw.

f f The two eminences upon which the condyles move, in many actions of that bone.

Fig. II. A view, from above and behind, of the Lower Jaw, with a full ſet of Teeth; ſhewing the cutting edges and grinding ſurfaces of the Teeth in that Jaw, with the Coronoid Proceſſes, and condyles for articulation.

a a a a The four *Inciſores.*

b b The two *Cuſpidati.*

c c The four *Bicuſpides.*

d d The ſix Grinders.

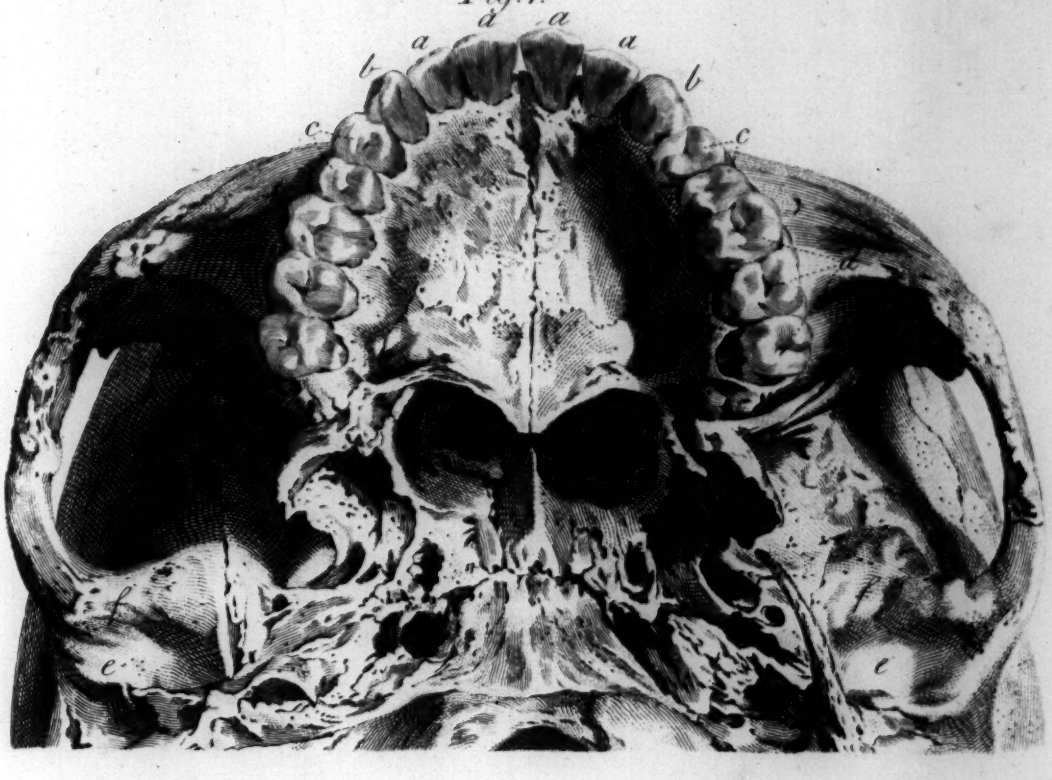
e e The Coronoid Proceſſes.

f f The Condyles.

Fig. III. The moveable cartilage of the joint of the Lower-Jaw.

a The cut ſurface of a longitudinal ſection of it. The lower and concave ſurface is what is articulated with the Condyle, the upper and convex ſurface is what is in contact with the Temporal Bone.

Fig. 1.



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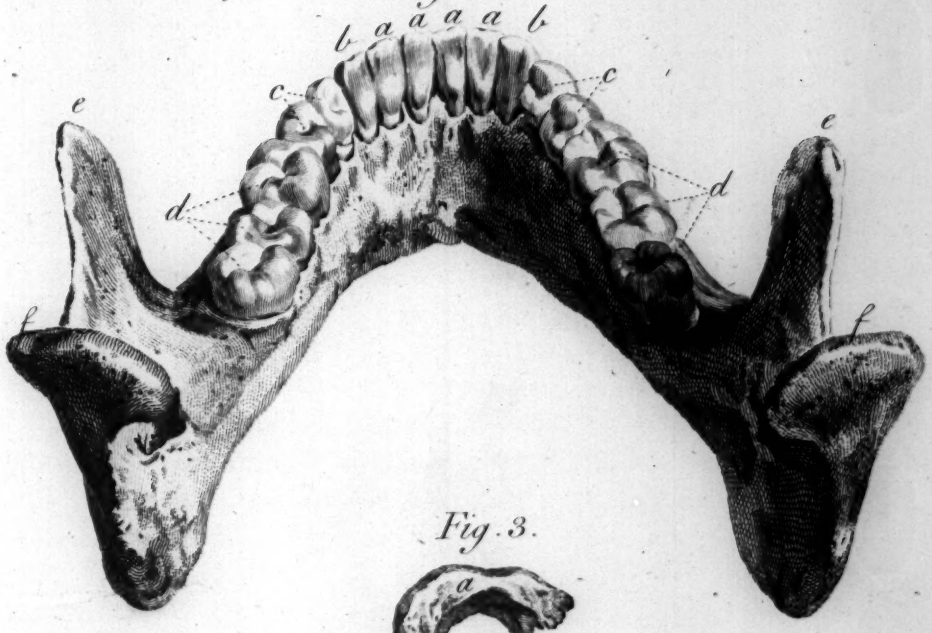

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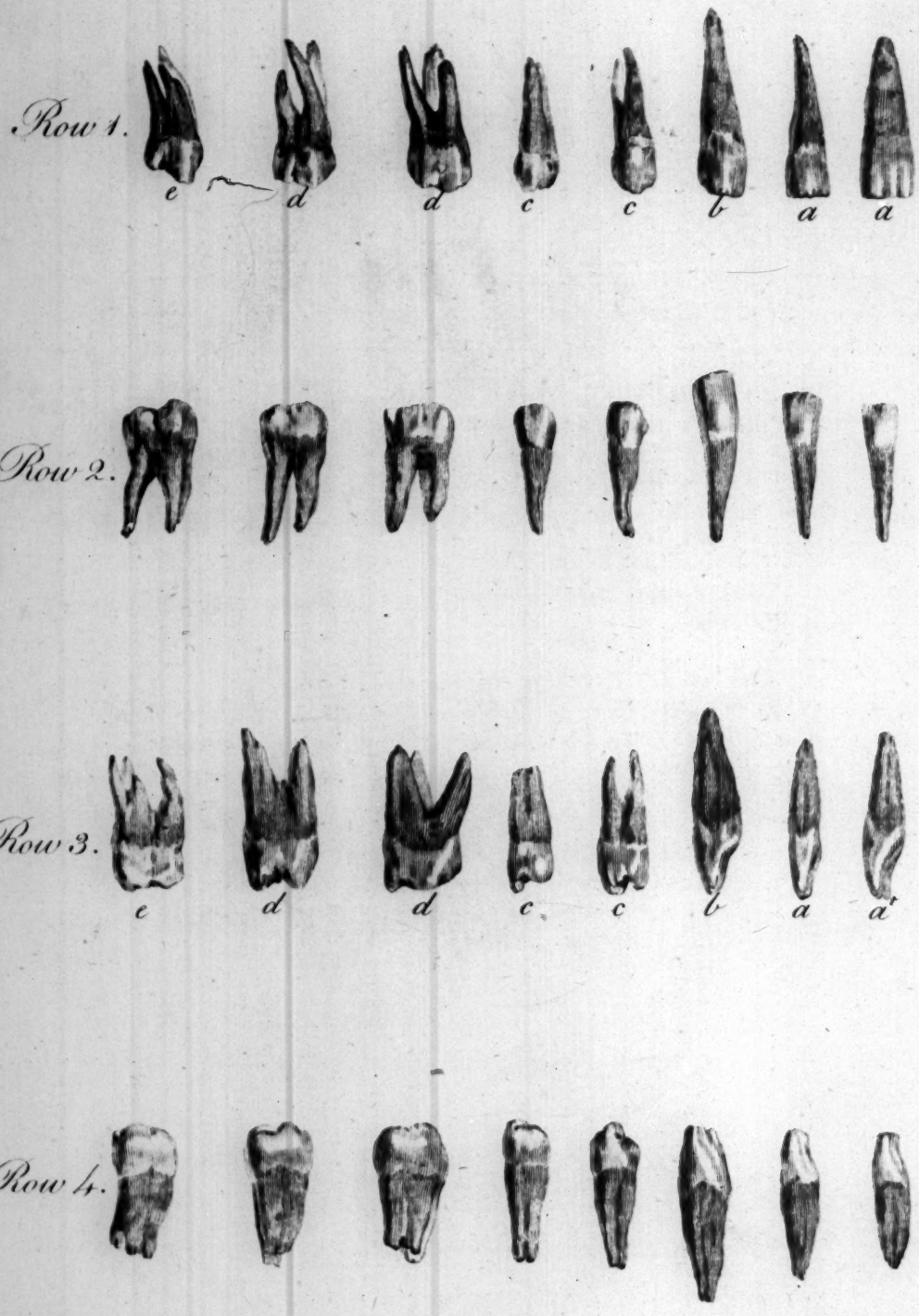

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PLATE V.

Two views of the ſixteeen Teeth of one ſide of both Jaws, taken out of their ſockets to expoſe the whole of each Tooth.

Row 1. The Teeth of the Upper-Jaw, ſeen from the outſide.

Row 2. The ſame view of the Teeth of the Lower-Jaw: the five ſingle are ſimilar to thoſe in the Upper-Jaw, but the Grinders in this have only two fangs.

a a The two *Inciſors.*

b The *Cuſpidatus*, ſhewing in the ſame view how much it is longer than the others.

c c The *Bicuſpides.*

d d The two firſt Grinders, having three fangs.

e The third Grinder, or *Dens Sapientiæ* having alſo three fangs.

Row 3 and 4. A ſide view of the ſame Teeth, ſhewing that the *Inciſores* and *Cuſpidati* in this view differ from the former view more than the *Bicuſpides* or Grinders.

Row 3, *a a* The two *Inciſores* of the Upper Jaw, ſhewing the hollowed inner ſurface of the body of thoſe Teeth.

b The *Cuſpidatus*, ſhewing the ſame.

c c The *Bicuſpides*, ſhewing the two points on the baſis of each. The firſt of them has a forked fang.

PLATE VI.

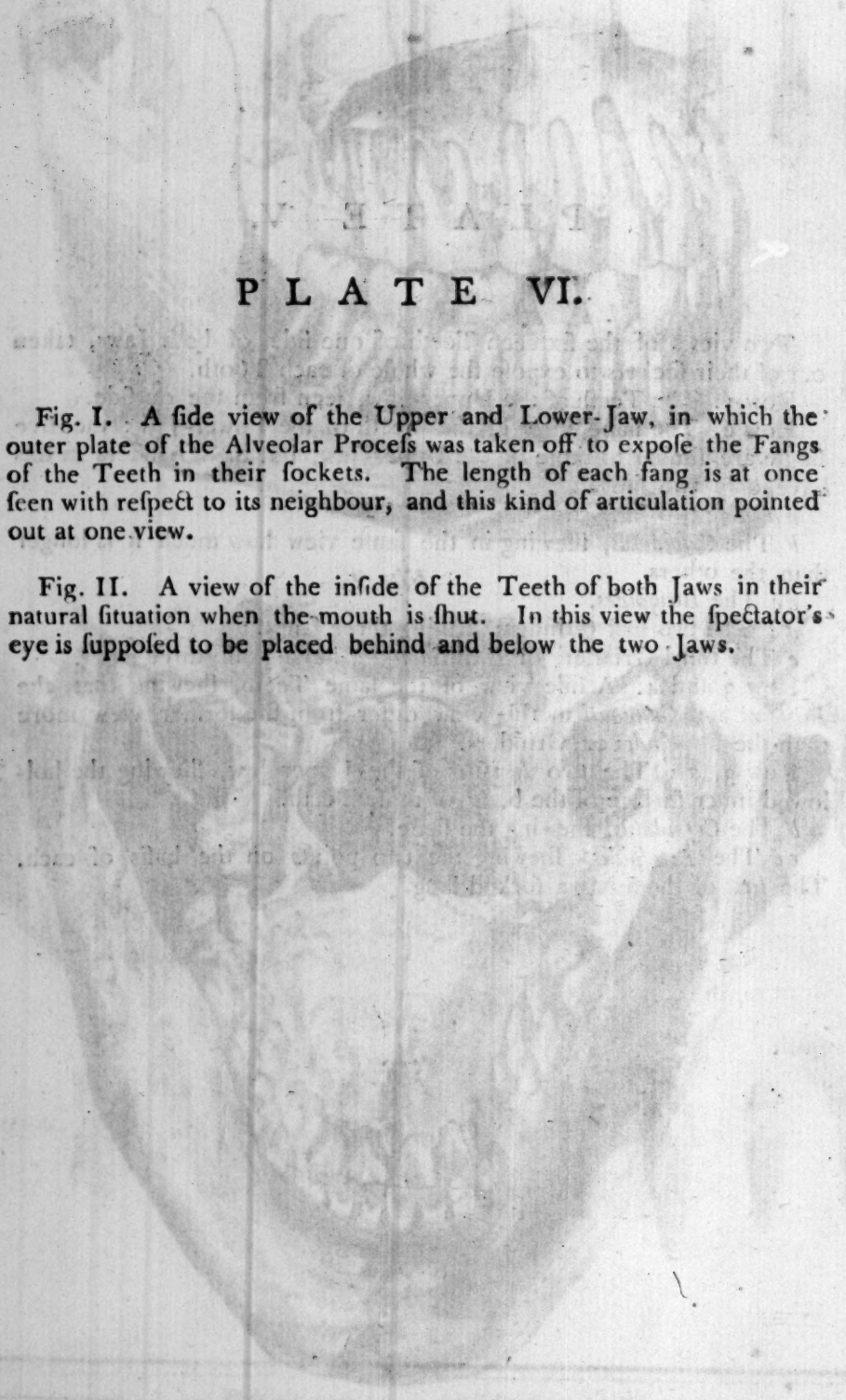
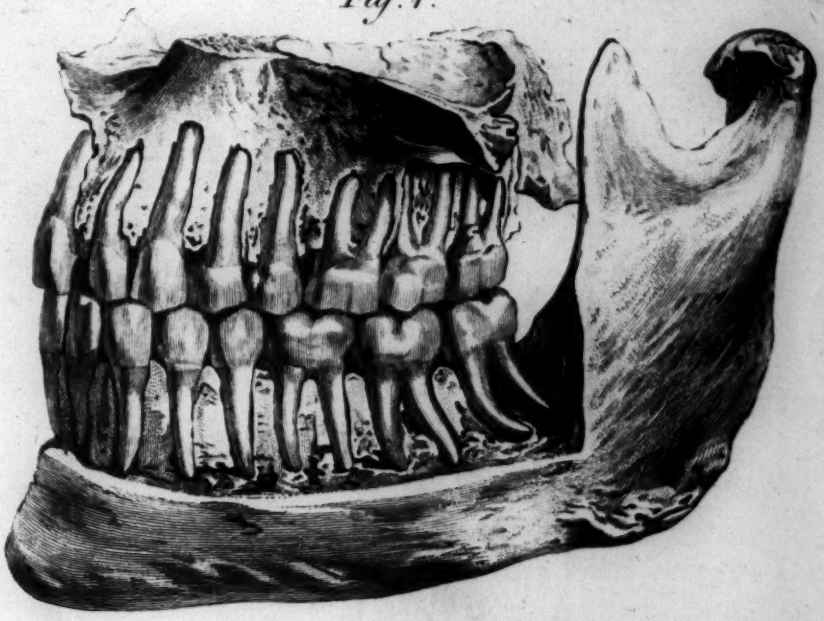


Fig. I. A ſide view of the Upper and Lower-Jaw, in which the outer plate of the Alveolar Proceſs was taken off to expoſe the Fangs of the Teeth in their ſockets. The length of each fang is at once ſeen with reſpect to its neighbour, and this kind of articulation pointed out at one view.

Fig. II. A view of the inſide of the Teeth of both Jaws in their natural ſituation when the mouth is ſhut. In this view the ſpectator's eye is ſuppoſed to be placed behind and below the two Jaws.

Fig. 1.



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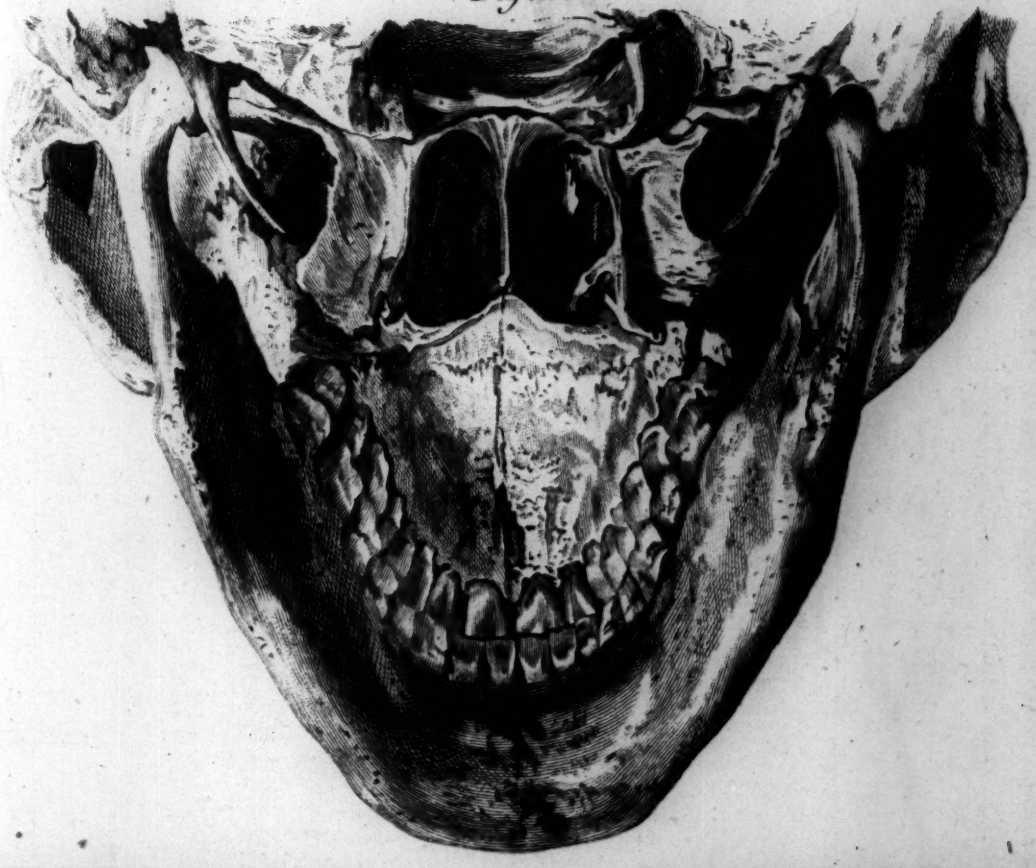

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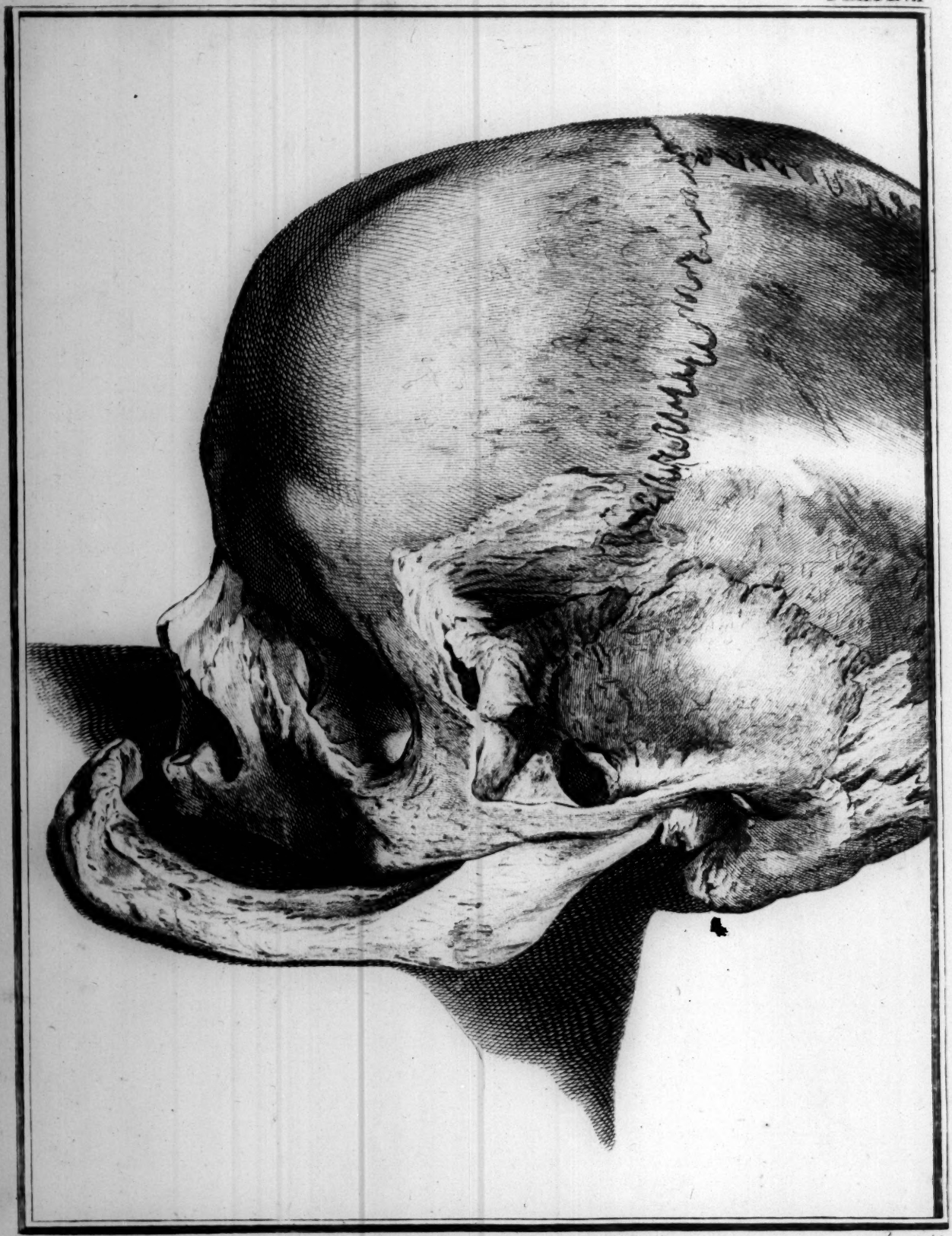

J. Van Rimsdyk fecit.

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P. Fourgeron sculp.

PLATE VII.

The bones of the head of a very old woman, who had loſt her Teeth a conſiderable time before death. The whole Alveolar Proceſſes are gone in both Jaws, which allows of the Lower-Jaw being raiſed above two Inches higher than what is common in ſhutting the mouth, before the gums of both Jaws can come into contact; by this increaſed motion of the Lower-Jaw, the chin is brought more upon a line with the articulation, therefore projects beyond the Upper-Jaw conſiderably.

PLATE VIII.

This plate ſhews the gradual growth of the two Jaws, eſpecially of the Alveolar Proceſſes.

Fig. I. and II. One ſide of the Lower and of the Upper-Jaw of a Fœtus about three or four months old.
a a The groove which is afterwards formed into Sockets.

Fig. III. and IV. One ſide of the Lower and of the Upper-Jaw of a Fœtus about ſix months old, at which age (*aa*) ſome of the partitions have ſhot acroſs near the anterior part, forming diſtinct cells.

Fig. V. and VI. The Upper and Lower-Jaw of a new born child, ſhewing the laſt mentioned circumſtance in a more advanced ſtate.

Fig. VII. The Lower-Jaw of a child ſeven or eight months old, in which the two firſt *Inciſores* had cut the gum, ſhewing the ſockets of ſix Teeth.
a a The mouths of the Alveoli contracted over the Teeth, eſpecially thoſe of the Grinders, where they have not yet begun to open for the paſſage of the Teeth.

Fig. VIII. A ſketch of an Upper-Jaw where the *Cuſpidatus* of that ſide had been formed high up in the Jaw, and therefore never could appear through the Gum. *a* The fang of the *Cuſpidatus*. *b* Its body contained in the Upper-Jaw and Alveolar Proceſs.

Fig. IX. A ſketch of the Upper-Jaw of a child, where the *Cuſpidatus* was inverted, ſo that its point was turned up againſt the Jaw, and the growing mouth of its cavity towards the Gum. *a* The point of the *Cuſpidatus* turned up againſt the Jaw. *b* The open and growing part of the Tooth which ſhould be formed into a fang.

Fig. X. The out-line of the Lower-Jaw of a child, to ſhew that the Condyle is then nearly on a line with the Gums.

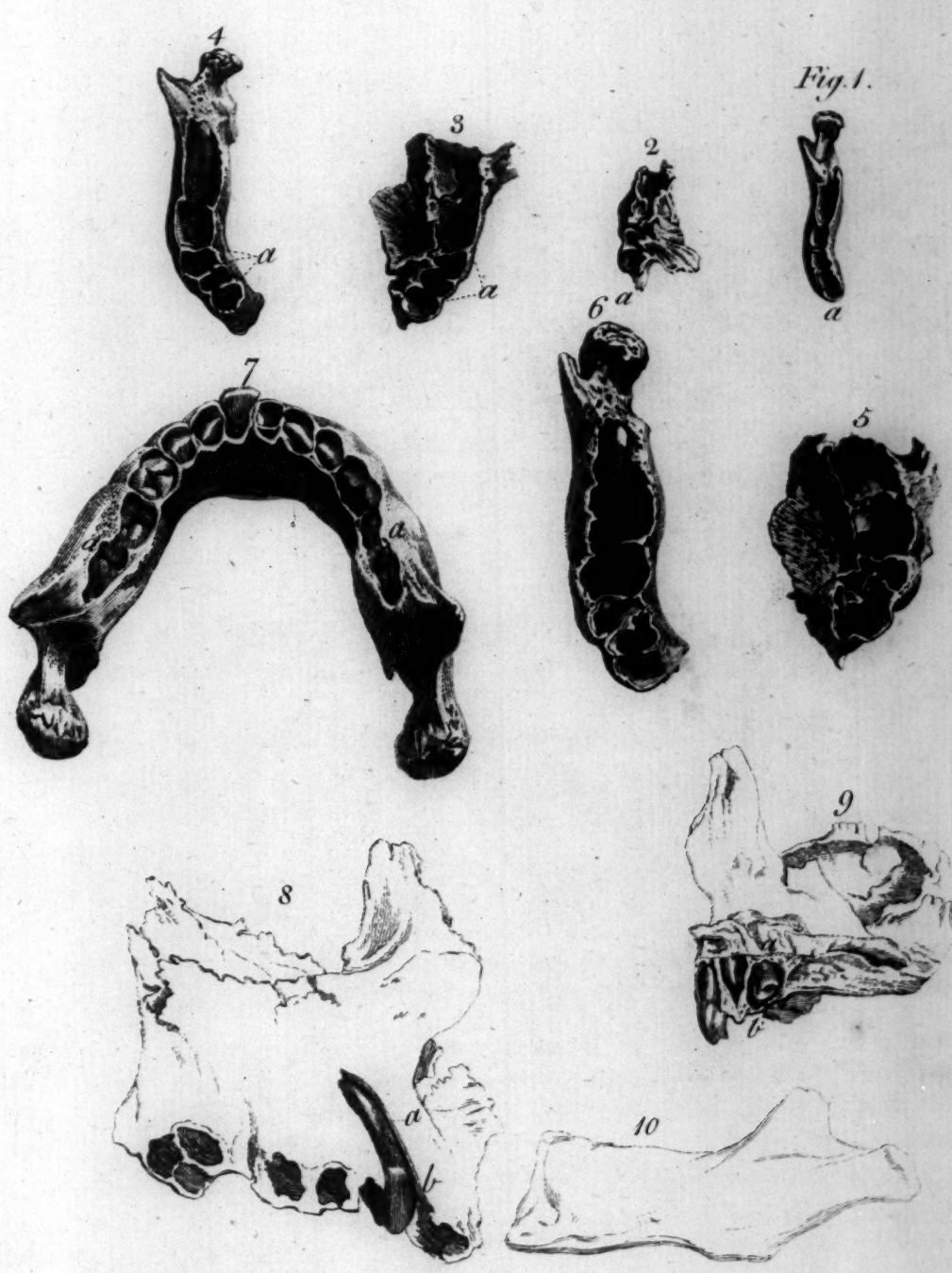

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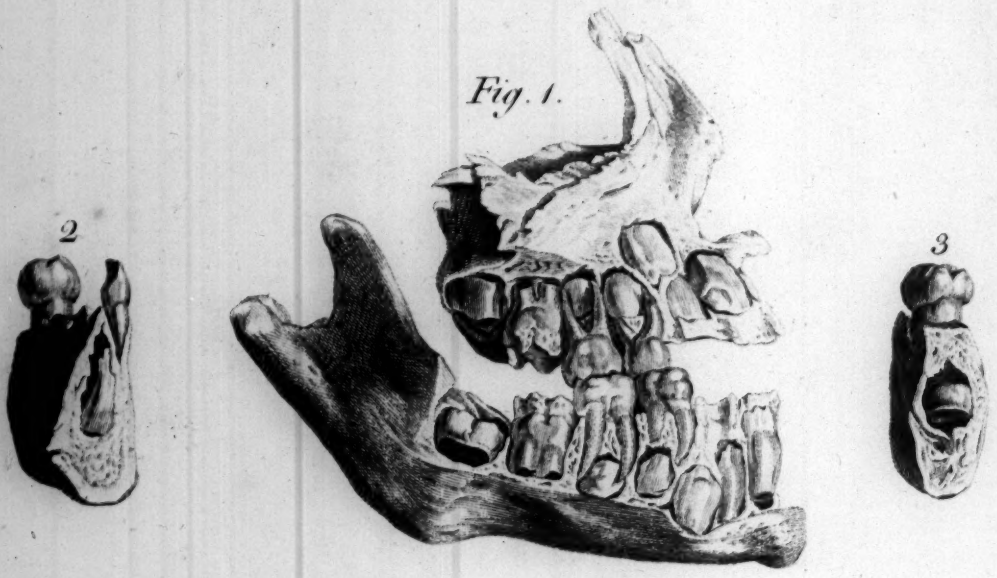
Fig. 1.



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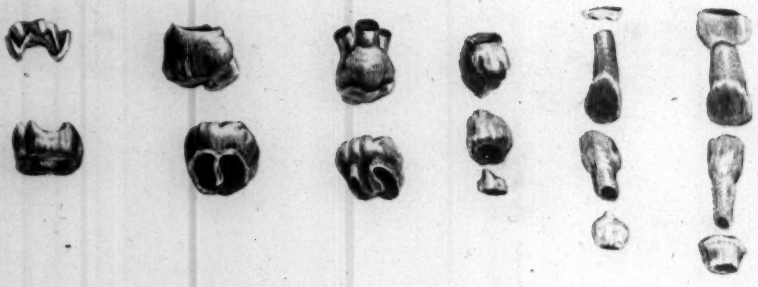

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PLATE IX.

Fig. I. One ſide of the Upper and Lower-Jaw of a ſubject about eight or nine years of age, where the *Inciſores* and *Cuſpidati* of the Fœtus were ſhed, and their ſucceſſors riſing in new ſockets; ſhewing likewiſe the two Grinders of the child, with the *Bicuſpides* forming underneath. The firſt adult Grinder was ready to cut the Gum; and the ſecond Grinder in the Lower-Jaw is lodged in the root of the Choronoid Proceſs, and in the Upper-Jaw it is in the tubercle.

Fig. II. Part of the Lower-Jaw cut through at the ſymphyſis. The *Inciſor* of the child is ſtanding in its ſocket, and the adult *Inciſor* forming in a diſtinct ſocket underneath.

Fig. III. Another view of the ſame piece of the Jaw, to ſhew that the *Bicuſpides* are formed in diſtinct ſockets of their own, and not in the ſocket of the Grinder which ſtands above.

Fig. IV. The five Teeth in the half of each Jaw of a Fœtus of ſeven or eight months, ſhewing the progreſs of oſſification from the firſt *Inciſor* to the ſecond Grinder.

Fig. V. The ſame teeth ſomewhat farther advanced.

Fig. VI. The Teeth of a child of eight or nine years of age, ſhewing the five temporary Teeth in a more advanced ſtate, with the firſt adult Grinder. The adult *Inciſores* and one *Cuſpidatus* are alſo begun to be formed.

PLATE X.

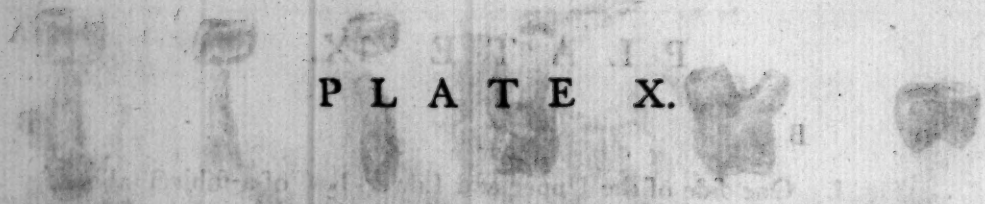
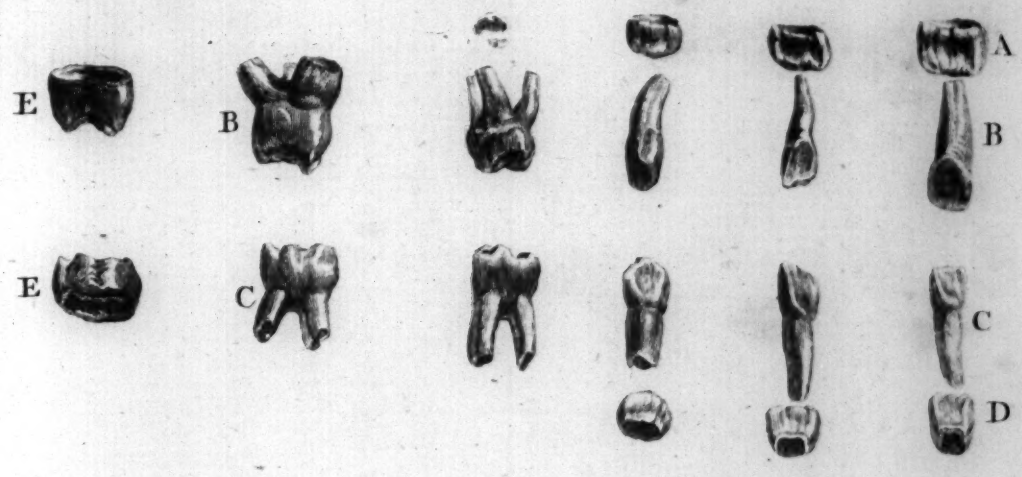


Fig. I. The Teeth of one ſide of both Jaws, from a child of five or ſix years of age. BB,CC The temporary Teeth almoſt completely formed. AD, Seven, viz. four above and three below, of the ſucceeding Teeth ſeen at the roots of the firſt ſet. EE, The body of the firſt adult Grinder nearly formed.

Fig. II. The Teeth of one ſide of both Jaws, from a child of ſeven years of age. This is an age in which there are more Teeth formed and forming than at any other time of life. BB,CC, The ten temporary Teeth complete. AD, Ten incomplete to ſucceed them. EE, Two adult Grinders; making twenty-two in this ſide, and of courſe forty-four in the whole. *aaaa*, The Fangs of the temporary *Inciſors* begining to decay at their points.

Fig. 1.



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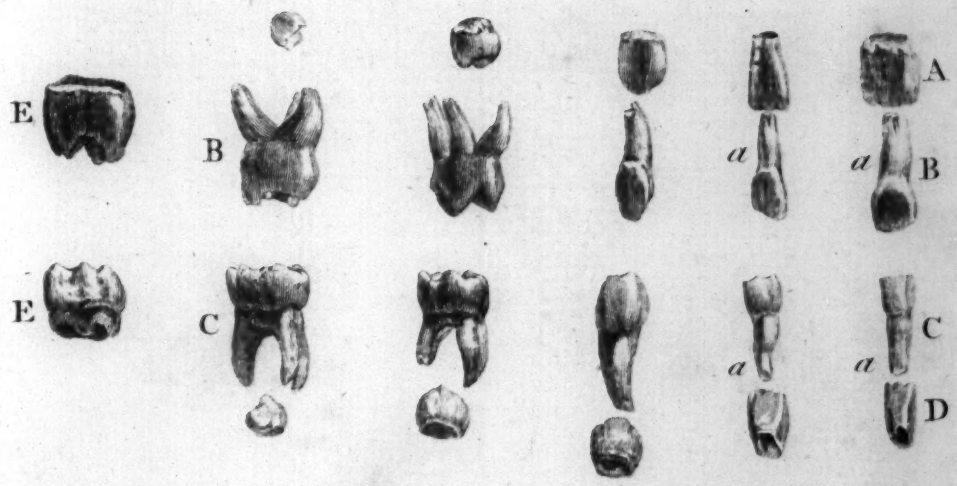

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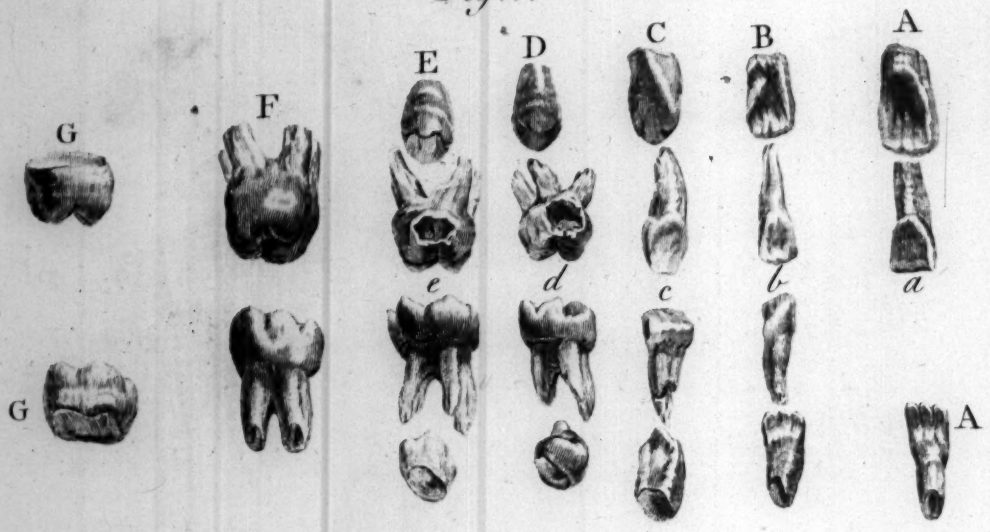
Fig. 1.



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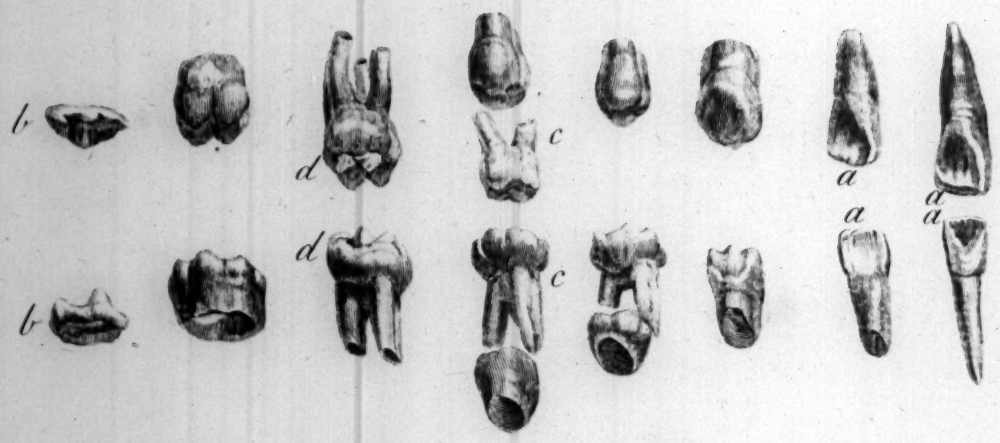

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PLATE. XI.

Fig. I. The Teeth of a child eight or nine years old; principally to ſhew the progreſs of the ſecond Set, and the beginning and decay of the firſt Set.

A A, The firſt *Inciſores* of the ſecond or permanent Set. B. The ſecond *Inciſor*. C, The *Cuſpidatus*. D E, The *Bicuſpides*. F G, The two firſt *Molares*.

a b, The temporary *Inciſores*, the firſt of which in the lower Jaw is wanting, having been ſhed. *c*, The *Cuſpidati*. *d e*, The temporary *Molares*.

Fig. II. The Teeth of a youth about eleven or twelve years old, ſhewing the farther progreſs of the one Set towards perfection, and of the other in their decay.

a a a a, The *Inciſores* of the ſecond Set, which had all cut the Gum. *b b*, The Baſis of the third *Molaris* or *Dens Sapientiæ*. *c c*, The remaining *Molares* of the firſt Set, with decayed Fangs. *d d* The two firſt *Molares* of the ſecond Set, ſo much advanced that they had cut the Gums.

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PLATE XII.

Fig. I. The Lower-Jaw of a Fœtus, from which part of the Gum and bony ſocket is taken off, to expoſe the membrane which incloſes the Teeth. *a*, The upper edge of the gum. *b b b*, The membrane which covers the Teeth.

Fig. II. The Upper-Jaw of the ſame Fœtus, ſhewing the ſame membrane in that Jaw.

Fig. III. The Lower-Jaw of a new-born child, where this incloſing membrane is opened, to ſhew the bodies of the Teeth that were covered by it. The blood veſſels which run in its ſubſtance are alſo expoſed.

a, The body of the Tooth. *b*, The membrane.

Fig. IV. That part of the Jaw and Gum which contains the *Cuſpidatus*. The whole is a little magnified. The membrane is opened and turned off on each ſide, and the fore part is turned down. The upper part of the pulp is covered with its bony ſhell, which is ſeen by its want of veſſels.

a, The oſſified part of the Tooth. *b*, The pulp. *cc*. The membrane opened and turned back.

Fig. V. and VI. Two pulps magnified. Fig. V. The pulp of the *Cuſpidatus*, Fig. VI. That of the Grinder. The oſſifications are removed, to ſhew that the pulp is of the ſame ſhape with the Tooth which is formed upon it. As far down on the pulp as the veſſels are ſeen, the oſſification had advanced; which ſhews that it is more vaſcular where the operation of oſſification is going on. The lower ragged edge, *a*, is part of the capſula turned down.

Fig. 7. One of the Grinders of the Lower-Jaw, ſawed down to expoſe the two cavities or canals leading to the body of the Tooth, where they unite, and form a ſquare cavity. In theſe two canals are ſeen two arteries, which run on to the common cavity, and there ramify. The veins are not injected. The whole is magnified.

In the body of the Tooth may be obſerved a number of ſtrata, each of which is loſt in the circumference of the Tooth.

a a, The Jaw-bone and Gum cut through. *b*, The body of the Tooth. *c c*, The two fangs. *d d*, The arteries running into the cavities of the fangs.

Fig. VIII. An *Inciſor* prepared and magnified in the ſame manner, ſhewing the ſame circumſtances in that Tooth.

Fig. 1.

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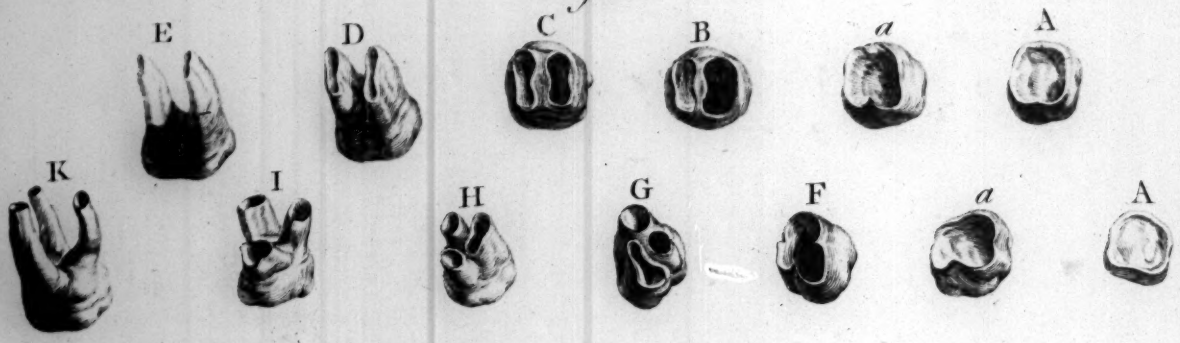
Fig. 1.



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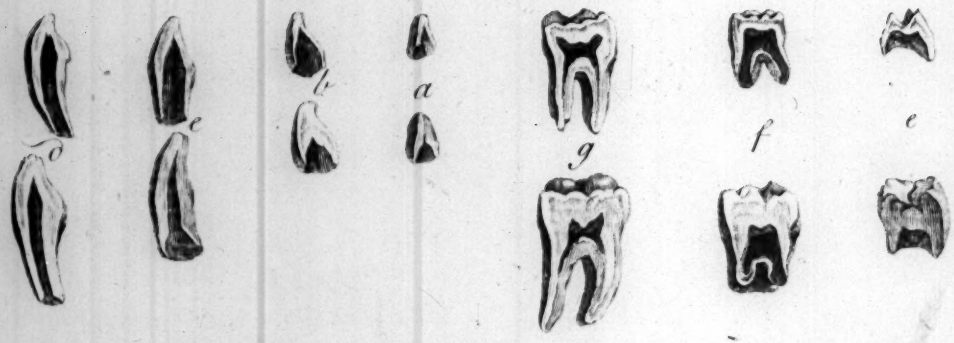

Fig. 3.

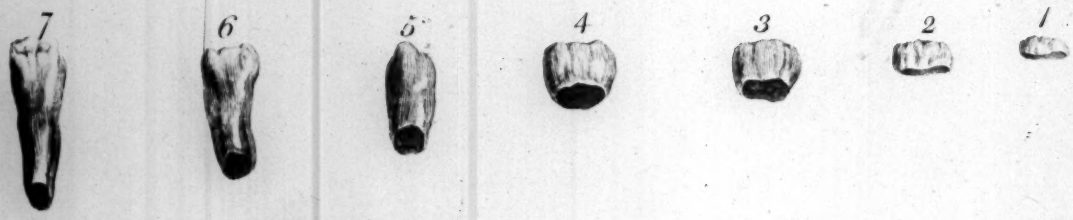

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PLATE XIII.

Fig. I. Shews the formation of the cavity and fangs of the Molares. The upper row are thoſe of the Lower-Jaw, and the Lower thoſe of the Upper. A A, *a a*, is the common cavity in the body of the Tooth, which in the 2d, *a a*, is deeper than in the firſt. B ſhews the bony arch thrown over the mouth of the cavity, and dividing that into two openings which give origin to the two fangs. C D E, The progreſs of theſe fangs. F, a Molaris of the Upper-Jaw, where the mouth of the cavity is a little tucked in, at three different points, from which three oſſifications ſhoot. G ſhews theſe oſſifications, and the beginning of three fangs. H I K, ſhews the gradual growth of theſe fangs.

Fig. II. Is a comparative view of the Inciſors and Grinders of the child and adult; for the better underſtanding of which they are ſawed down the middle, ſhewing in a ſide view the gradual increaſe of theſe Teeth. The uppermoſt row is of the child, and the lower of the adult. *a b c d*, Shew the gradual growth of the body, fangs, and cavity of the *Inciſors* of both ages. *e f g*, Shew theſe circumſtances in the Grinders.

Fig. III. 1, 2, 3, 4, 5, 6, 7, ſhewing the gradual growth of a ſingle Tooth, from its formation nearly, to its being almoſt complete.

PLATE XIV.

Fig. I. II. III. IV. V. and VI. Shew the cavities of the Teeth in the *Inciſores*, *Cuſpidatus*, *Bicuſpidatus*, and *Molares*.

Fig. VII. A *Molaris* of the Lower-Jaw, with part of its fangs ſawed off, to ſhew that the ſides of the cavity or canal have grown together, and divided it into two ſmall canals, which are repreſented by the two dark points.

Fig. VIII. and IX. The cavity in the body of the Teeth ſeen in tranſverſe ſections.

Fig. X. and XI. Longitudinal ſections of the *Molares* to expoſe the cavities.

Fig. XII. The baſis of a *Molaris* whoſe points were worn down, and the bony part which projected into thoſe points expoſed.

Fig. XIII. A *Molaris*, whoſe bony part is wholly expoſed, and only a circle of Enamel left covering the ſides all round.

Fig. XIV. and XV. A lateral view of the Enamel of a *Molaris* and a *Bicuſpis* cut longitudinally.

Fig. XVI. A *Cuſpidatus* worn ſo much down, as to expoſe the whole end of the bony part, a circle only of Enamel remaining.

Fig. XVII. An *Inciſor* ſlit down its axis, to ſhew the Enamel upon the body of the Tooth, covering much more of the convex than of the concave part.

Fig. XVIII. An *Inciſor*, ſhewing the ſame as Fig XVI.

Fig. XIX. A horſe's Tooth ſlit down its whole length, to ſhew how the Enamel is intermixed with the bony part, and that it paſſes through the whole length of the Tooth. The Enamel is repreſented by the white lines, which are peniform, ſhewing the ſtriated texture of the Enamel.

Fig. XX. The grinding ſurface of a horſe's *Molaris*, to ſhew the irregular courſe of the Enamel.

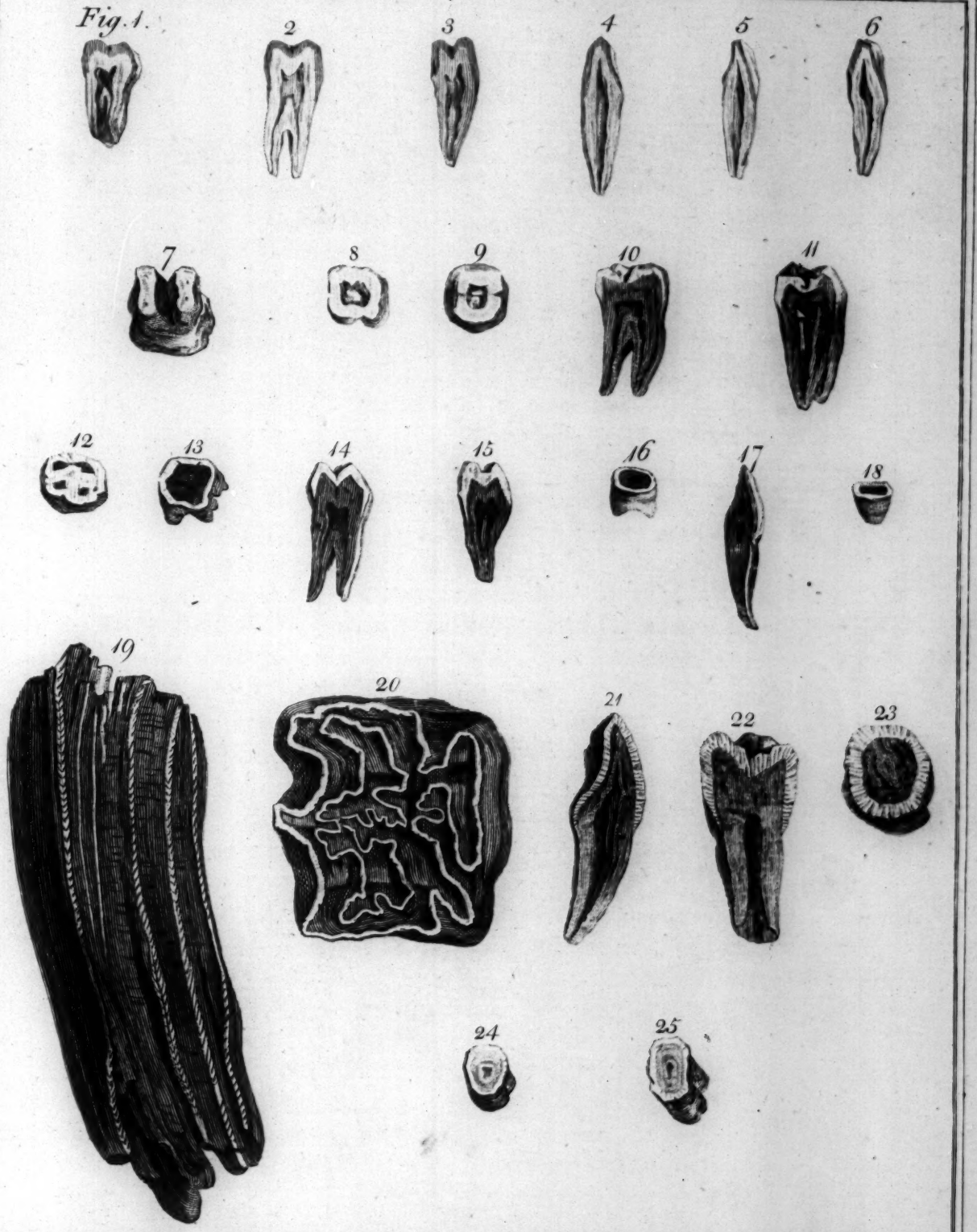
Fig. XXI. An *Inciſor* a little magnified, ſlit down its middle, to ſhew that the Enamel is ſtriated, and that the *Striæ* are all turned towards the centre.

Fig. XXII. A Grinder in the ſame ſtate, to ſhew the ſame circumſtances.

Fig. XXIII. The baſis of a *Molaris* broken through, ſhewing that the Enamel is ſtriated in this view alſo, and that all the *Striæ* point to the centre. N. B. The Teeth muſt be broken to ſhew theſe facts.

Fig. XXIV. An old Tooth, whoſe baſis has been worn down below the original termination of the cavity in the body of the Tooth, and that end has been filled up, in the ſame proportion, with new matter, to prevent the cavity being expoſed. This matter is of a darker colour, as repreſented in the figure.

Fig. XXV. Another Tooth in the ſame ſtate.



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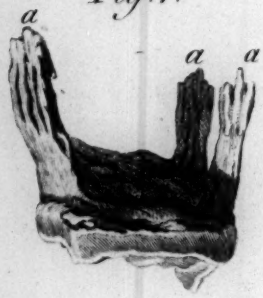

Fig. 2.

Fig. 3.

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PLATE XV.

Fig. I. A horſe's Tooth that was juſt ready to be ſhed. The three parts of the Tooth which ſtand up *a a a* incloſed the riſing end of the young Tooth. This is all that was left of a long Tooth.

Fig. II. A ſeries of Grinders of the Child, from their being complete to their utmoſt decay. *a* is a Grinder of the Upper-Jaw nearly complete, in which the three fangs are almoſt formed. *b* has ſome of its fang abſorbed, *c* more, *d* ſtill more, *e* nearly all gone, and *f* the whole of the fangs gone, only the neck and body remaining.

Fig. III. A ſeries of *Inciſores* in the ſame ſtate. No. 1. A complete formed Tooth. 2. The fang ſomewhat decayed. 3. More ſo. 4. Still more. 5. The fang almoſt gone: and, 6. the whole fang gone, the neck and body only remaining.

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PLATE XVI.

Fig. I. The outlines of a Lower-Jaw, in which one or two Grinders have been loſt out of the ſpace *a*, and where the bodies of the two adjacent Teeth, *b c*, have approached one another, by the preſſure which has been applied to their baſis in maſtication, from the want of their ſupport on that ſide: we ſee alſo the waſte of the *Alveoli* which belonged to the loſt Teeth.

Fig. II. Four Lower-Jaws at different periods of life, from the age when the five ſhedding Teeth are completely formed, to that of a complete ſet. This figure ſhews four things: 1. The lengthening of the Jaw backwards, which is ſeen by the oblique line made by the four condyles: 2. The gradual riſe of the two proceſſes above the line of the Teeth: 3. The gradual increaſe of the Teeth in proportion as the Jaw lengthens: And fourthly, the part formed, always keeping of the ſame ſize. *a a a a* The Condyles. *b b b b* The Coronoide Proceſſes. *c* The *Alveolus*, in which the Grinder of the Adult is forming. *d d d* The firſt Grinders formed. *e e* The *Alveoli* for the formation of the ſecond Grinder. *f f* Theſe completely formed. *g g* The *Alveoli* for the third Grinder. *h* That Grinder formed.

The two lines *i k* and *i m* mark the diſtance between the ſymphyſis of the chin and ſixth Tooth; they are parallel, or nearly ſo: it is impoſſible that there ſhould be a mathematical exactneſs in four different Jaws. The line *i l* ſeparates the *Inciſores* and *Cuſpidatus* from the *Molares* in the child, and the *Bicuſpidates* in the adult. This line is oblique, and the diſtances between the two ends of the two lines, *i k* and *i l*, at *i i*, is nearly the ſame with the diſtance between the ends of the two lines *i l*, and *i m*, at *l m*.

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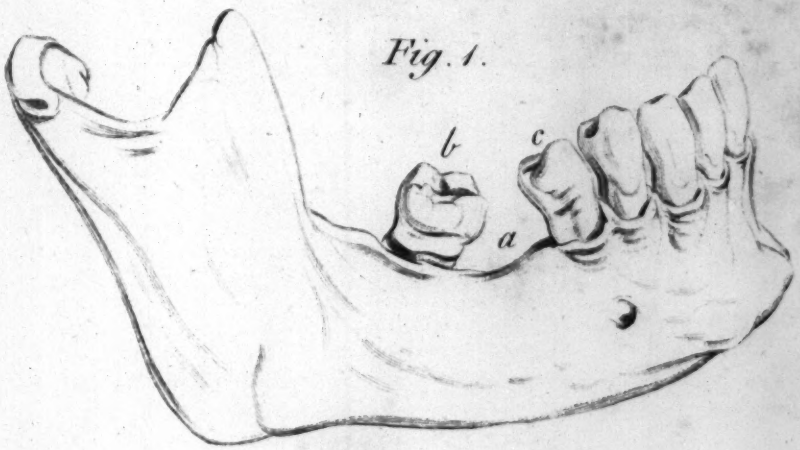
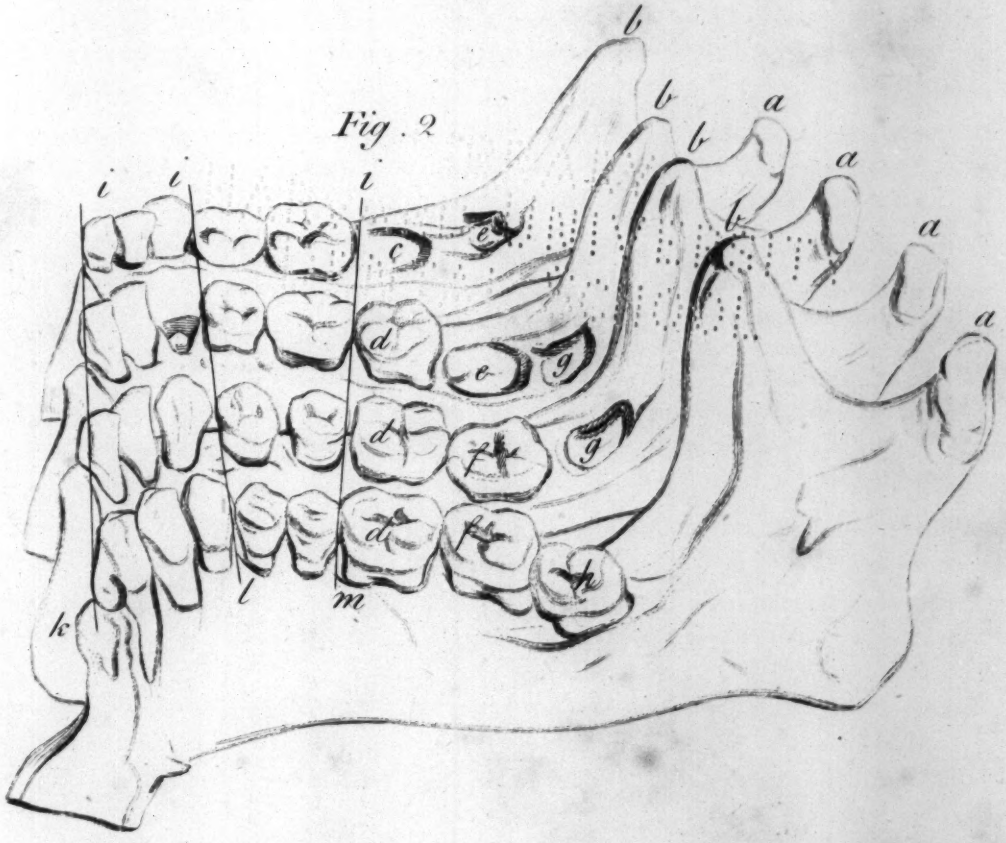


Fig. 2



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